NETWORK WORLD
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Telcos meet to form POS service rules

By Bob Brown
Senior Editor

WASHINGTON, D.C. — Representatives from Bell Communications Research and a group of regional carriers plan to meet here this week to discuss offering a set of uniform services for point-of-sale and other transaction-oriented applications.

By offering retailers and other customers consistent data transmission services, the carriers hope to make it easier for users to manage networks that cross regional carrier boundaries.

The group, which met for the first time with Bellcore representatives two weeks ago in Denver, hopes to develop technical guidelines for carriers offering data over voice and other transaction processing services.

Bellcore's National Services Coordinating Group commissioned a special committee of carrier and Bellcore representatives to develop these guidelines and present a prospectus, said Rick Chapman, a group manager for new products at US West, Inc.'s US West Communications, Inc. subsidiary.

In addition to US West, attendees at the first meeting included representatives from the other

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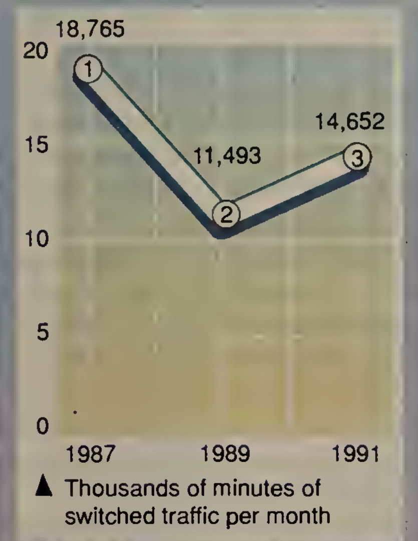
Changing economics of international lines

Calculating the crossover point of switched voice and fax traffic needed to justify a 56K bit/sec New York-to-London circuit



Model assumptions:
- 22% of calls during busiest hour, 25% of which are faxes.
- Average call length of 4.5 minutes.

① Based on AT&T International Long-Distance switched service pricing. Leased-line alternative would support 2 voice channels and result in 56% busy-hour call blockage.

② Based on AT&T World Connect rates. Leased line would support 8 voice channels and call blockage below 10%.

③ Based on AT&T Global Software-Defined Network rates. Leased line would support 8 voice channels and call blockage below 10%.

SOURCES: AT&T , BASKING RIDGE, N.J.; BRITISH TELECOMMUNICATIONS PLC., LONDON; AND COMMUNICATIONS NETWORK ARCHITECTS, INC., WASHINGTON, D.C.
GRAPHIC BY SUSAN J. CHAMPENEY

Global net users rethink public/private service mix

Leased lines become more attractive, but growth of international virtual nets changes the landscape.

By Barton Crockett
Senior Editor

New technologies have dramatically altered the economics of global communications over the past few years by reducing the cost of private network facilities.

Since 1987, the prices for some international leased lines have slid more than 50%. This, combined with powerful new voice-compression technologies, has made international private networks more cost-effective than ever before.

But just as international private networking has begun to pick up steam, new low-cost virtual net services are emerging that promise to tip the scales back in favor of switched facilities. As a result, users are scrambling to make sure their international net strategies are on target.

"Users are absolutely reevaluating what they're doing," said Chuck Papageorgiou, manager of

(continued on page 54)

SynOptics airs grand plan for net control

Hub maker opts for distributed management, boosts SNMP support, adds bridge/router tools.

By Eric Smalley
Senior Editor

SANTA CLARA, Calif. — SynOptics Communications, Inc. last week boosted the Simple Network Management Protocol (SNMP) capabilities of its Ethernet hub and introduced a distributed network management architecture.

The company also announced bridge and router modules for its local-area network hubs and detailed plans to introduce a token-ring bridge module.

SynOptics' distributed network management processing scheme, implemented by a new product called the LattisNet Model 3040 Network Control Engine (NCE), is one of the first products to support what many are calling the next phase in the evolution of network management.

This phase involves establishment of hierarchical management structures in which raw network data is processed by intermediate management devices positioned strategically throughout a net.

Only when error counts exceed predefined thresholds are event messages passed on to an upper level centralized network management station.

This transfer saves managers of large networks from dealing with raw data from distant network elements. The managers

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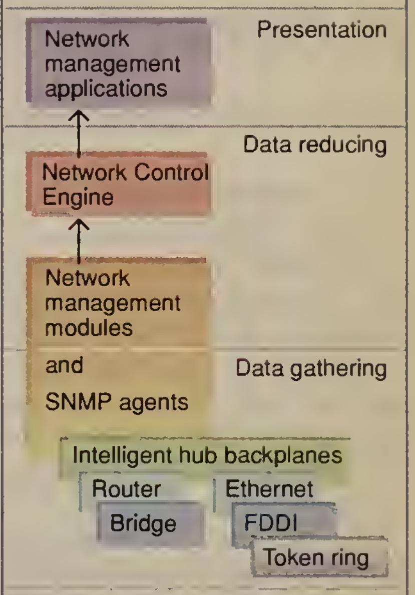
SynOptics' hierarchical net management



SOURCE: SYNOPTICS COMMUNICATIONS, INC., SANTA CLARA, CALIF.
GRAPHIC BY SUSAN J. CHAMPENEY

Tariff 12 users plan for the worst

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — As the industry weighs in today with comments on the FCC's reinvestigation of Tariff 12, some users say they are anxious enough about the fate of their custom networks to develop contingency plans in case Tariff 12 is overturned.

At a conference sponsored last week by TeleStrategies, Inc., users including American Express Co. and USAir, Inc. said Federal Communications Commission approval of AT&T's Tariff 12 once again is far from certain and acknowledged that they are examining alternative net plans in the event that Tariff 12 is found illegal.

The primary legal question

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NETLINE

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IBM TO UNVEIL APPN support for its 3174 cluster controller. Page 2.

GROUP TO EXAMINE 7 technologies for use in an object-oriented application blueprint for net environments. Page 2.

COS ISDN COUNCIL members back common ISDN specifications to boost service usage. Page 4.

NEW MCI 800 SERVICE feature offers customized call routing and messaging capabilities. Page 4.

NTIA UNVEILS PLAN for auctioning off radio spectrum. Page 4.

BELL ATLANTIC, NYNEX and Southwestern Bell outline schedules of tariffing ISDN services. Page 54.

NEWSPAPER

FEATURE

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Caution advised in choice of systems integrator

By Salvatore Salamone
Features Writer

In turbulent markets, buyers face both opportunity and risk. Dealing with systems integrators involves plenty of both.

There's a growing trend toward using systems integrators to handle major network projects. One indication of this is integration firms' booming revenues. Integrator revenues are projected to more than triple by 1994, according to International Data Corp., a consulting firm in Framingham, Mass.

There are several good reasons to consider using integrators. At times, user firms don't have the in-house technical expertise to tackle a project or they have insufficient staff to

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IBM expected to serve up surprise in APPN rollout

Besides giving OS/2 Extended Edition APPN support, company will add APPN to the 3174.

By Paul Desmond
Senior Editor

WHITE PLAINS, N.Y. — IBM this week is expected to announce Advanced Peer-to-Peer Networking (APPN) capabilities not only for OS/2 Extended Edition workstations as expected, but also for its 3174 Establishment Controllers.

APPN support will enable the 3174 to act as a low-end Systems Network Architecture router, linking APPN-equipped workstations or local-area networks to one another without host intervention, analysts said.

But APPN support on the 3174 will have virtually no effect on the installed base of 3270 applications; it only applies to devices supporting IBM's LU 6.2/Advanced Program-to-Program Communications (APPC) protocol.

APPN is designed to ease network configuration. APPN nodes can make their presence known in a network without being manually defined in configuration tables. It also optimizes routing because data can take the most efficient path between APPN nodes rather than traversing a mainframe.

(continued on page 8)

Nasdaq enlists MCI muxes to construct nationwide net

System will help exchange guard against disaster.

By Barton Crockett
Senior Editor

TRUMBULL, Conn. — Nasdaq, Inc. last week said it is building a nationwide data network based on multiplexers owned and operated by MCI Communications Corp. that will bolster the electronic exchange's disaster recovery capabilities.

The network, based on T-1 and 64K bit/sec trunks, is scheduled to be cut over in June. It will replace a mixed bag of point-to-point private lines, supporting speeds ranging from 2,400 to 64K bit/sec, used by brokerages and stock-quote vendors to obtain "special services" stock-quote information from Nasdaq.

Special services are raw trading information feeds sent directly from Nasdaq computers to systems operated by brokerages and stock-quote vendors, which then disseminate the data to more than 100,000 users and subscribers.

Doug Moore, associate director of network operations and planning at Nasdaq's main data center here, said the problem with the existing network arrangement is that brokerages and stock-quote vendors obtain their

(continued on page 6)

Object Management Group accepts 7 tech. proposals

By Jim Brown
Senior Editor

FRAMINGHAM, Mass. — The Object Management Group (OMG) said all seven technologies filed by last week's deadline will be considered for inclusion in the blueprint it is designing to help developers build object-oriented applications for distributed computing environments.

By August, OMG intends to select one of these technologies to form its Object Request Broker (ORB) specification. The request broker will define how distributed, object-oriented applications will exchange messages via a remote procedure call (RPC), enabling one system to kick off tasks on another across a net.

The technology could accelerate development of applications that enable users to click on an icon displayed on a workstation to invoke a series of software routines stored as an object on a network server. An object is code that defines specific data elements and the software routines needed to access and process them.

For example, clicking on an icon titled "report" could cause the workstation to create a series of messages that are passed via an RPC to a server-based object that describes the individual elements comprising the report, such as text, graphics and scanned images. It then executes the commands needed to retrieve those elements from one or more

(continued on page 6)

Briefs

NATA founder dies. Tom Carter, founder of the North American Telecommunications Association, died on Feb. 23 at the age of 67.

In 1959, Carter invented the Carterfone, a device for connecting a two-way radio to the public telephone network. The Bell System balked at the product, however, saying it did not meet company standards and could not be connected to the public network. Carter took the issue to the Federal Communications Commission, which issued its landmark Carterfone decision in 1968. That ruling allowed the connection of nontelephone company equipment to the public telephone network, therefore paving the way for the independent telecommunications equipment market.

Vendor to downsize VSATs. GTE Spacenet Corp. plans to roll out low-priced, low-end additions to its SkyStar very small aperture terminal product line within the next 30 days, according to Jim MacDonald, GTE Spacenet's director of network services. He said GTE Spacenet will "more than address the competitive offerings" on the low end, such as those announced by Hughes Network Systems, Inc. in December. The addition of the low-end VSATs will appeal to new and current VSAT users for sites they previously excluded due to cost factors, MacDonald said.

AT&T inks 16th Tariff 15 deal. AT&T has signed its 16th Tariff 15 deal with Siebe, Inc., a multinational firm based in the U.K. with subsidiaries located throughout the U.S. AT&T is offering to give the firm a 2% discount off of its Software-Defined Network Service Expanded Volume Plan. Siebe must sign up for a three-year term. AT&T said the deal was in response to an offer from MCI Communications Corp. in which Siebe would receive a discounted Vnet service.

MCI's Venezuelan connection. MCI Communications Corp. last week said it will offer digital satellite service from Venezuela to the U.S. and other countries. MCI also said it has filed an application to sell private and shared digital satellite earth stations to users in Venezuela. MCI hopes to commence service by year end. In addition, MCI said it hopes to be the first carrier to take advantage of new regulations allowing users and vendors to operate private and shared satellite networks in the country. An MCI official said he expects AT&T to provide a similar service.

AT&T offers incentive to stay. AT&T is offering AT&T Computer Systems employees bonuses as an incentive to stay with the telecommunications giant while it pursues NCR Corp., a spokesman for the carrier said last week. Many AT&T Computer Systems employees have begun looking for new jobs as a result of AT&T's plan to shut down much of its computer operations if the $6.12 billion NCR acquisition takes place. The AT&T spokesman said that although some AT&T Computer Systems employees are on the lookout for new jobs, a mass exodus has not taken place.

UBS banks on Newbridge. Union Bank of Switzerland (UBS) last week announced a $7.7 million contract with Newbridge Networks, Inc. for 112 T-1 multiplexers that will replace Timeplex, Inc. equipment in the bank's T-1 network. UBS will install 3600 MainStreet and 3612 MainStreet multiplexers plus Newbridge's 4602 MainStreet Network Manager.

UBS' international T-1 data network includes more than 280 Timeplex Link/1 and Link/2 multiplexers. The Newbridge contract is only for the replacement of domestic T-1 nodes.

Novell, Banyan post big gains. Novell, Inc. last week reported that its earnings for the first quarter, ended Jan. 26, more than doubled to $30.4 million, up from $15.1 million in the first quarter of 1990. Revenue for the quarter was $134.6 million, up 27% from last year's $105.9 million.

Banyan Systems, Inc., which is privately held and rarely releases detailed financial information, last week reported record 1990 revenue of $98.2 million, up 23% from $80 million in 1989. Net earnings rose 24% from 1989, reaching $4.7 million.

Banyan's annual results were boosted by a strong fourth quarter, ended Dec. 31, 1990, in which the company reported earnings of $2.3 million, up 53% over the comparable period the previous year. Fourth-quarter revenue was $28.4 million, up 35% from last year's fourth quarter.

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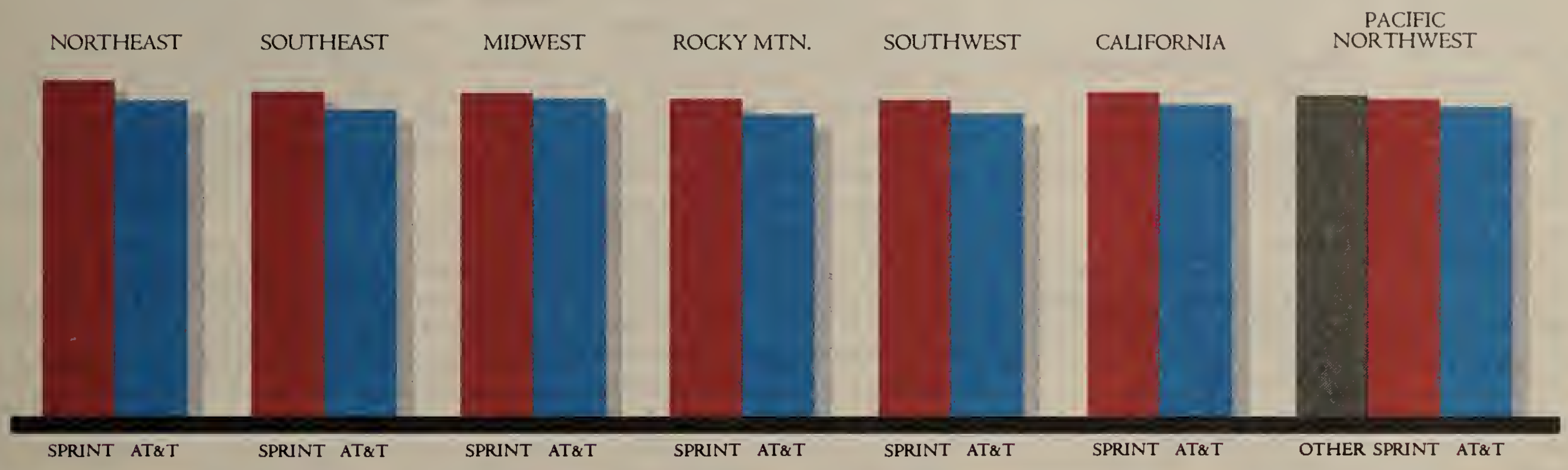
DEDICATED DATA CIRCUITS RATED BY REGION



YOU WIN SOME, YOU LOSE SOME.

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1988 *Sprint awarded 40% of Federal Telecommunications System 2000 contract.* 1989 *Sprint completes the world's first and largest privately-owned transatlantic fiber optic cable.* 1990 *Sprint announces the first commercial video services to the Soviet Union.*

Carriers, CPE firms pledge support for ISDN strategy

By Bob Wallace
Senior Editor

NEW YORK — As expected, the ISDN Executive Council of the Corporation for Open Systems International (COS) last week detailed plans here to incorporate a set of Bellcore technical references (TR) in their products beginning in 1992.

User, vendor and regional Bell holding company members of the ISDN Executive Council said widespread support for the TRs may accelerate deployment of Integrated Services Digital Networks, spur equipment development by a larger group of vendors and boost use of the technology.

The TRs, collectively referred to as National ISDN 1, define how customer premises equipment accesses an ISDN switch and how different vendors' switches interoperate using a Common Channel Signaling System 7 network ("User, vendor camps rally to boost ISDN," *NW,* Feb. 25).

The gathering, heralded by some as a watershed event for ISDN, was sponsored by the COS ISDN Executive Council, which was formed in January 1990 to promote deployment and use of ISDN. The council consists of users, carriers and equipment makers. Users include Aeronautical Radio, Inc., Eastman Kodak Co. and General Motors Corp.

Central office switch vendors pledged to support capabilities specified by the Bell Communications Research TRs, and three RBHCs mapped out their updated ISDN deployment plans at the event (see "Three RBHCs discuss ISDN strategies," page 54).

National ISDN 1 participants

Users:
- Aeronautical Radio, Inc.
- Eastman Kodak Co.
- General Motors Corp.

CO vendors:
- AT&T Network Systems Group
- Northern Telecom, Inc.
- Siemens Stromberg-Carlson

Regional Bell holding companies:
- Bell Atlantic Corp.
- Nynex Corp.
- Southwestern Bell Corp.

Computer vendors:
- Digital Equipment Corp.
- IBM

Others:
- Bell Communications Research

Council members not represented at the event:
- Apple Computer, Inc.
- Motorola, Inc.
- The Boeing Co.

The event was sponsored by the Corporation for Open Systems International.

GRAPHIC BY SUSAN J. CHAMPENY

Users said that although they're sold on ISDN, they will wait for vendors to deliver products that support National ISDN 1 before widely deploying the technology in their companies.

"We're facing an unprecedented increase in the amount of electronic data we transmit," said Rudolph Blatt, a network manager with GM. "It's going up by an order of magnitude, but we can't afford [transmission costs] to go up by an order of magnitude as well. The only way we know to control costs is through ISDN. We are convinced it's the way to go."

A year from now, GM will decide whether to use ISDN, Blatt said. Another attendee, Eastman Kodak, is trying to determine which ISDN services are currently offered by the seven RBHCs and the interexchange carriers.

"We've sent out about 60 requests for quote to see how far we can get with ISDN today and hope to hear back from the carriers in a few weeks," said Charles Gardner, information technology infrastructure director for Eastman Kodak's MIS Photographic Products Group. "We're just testing the water." Kodak would like to use ISDN at its regional marketing, sales and distribution sites.

Three vendors — AT&T Network Systems Group, Northern Telecom, Inc. and Siemens Stromberg-Carlson — plan to have switch software supporting National ISDN 1 ready for testing by phone companies in December and generally available in 1992.

"We've spent many millions of dollars to develop software that [supports] National ISDN 1," said Joseph Colson Jr., switching systems vice-president for AT&T.

(continued on page 54)

NTIA serves up plan for auctioning radio spectrum

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — The National Telecommunications and Information Administration (NTIA) last week unveiled a plan supported by the Bush administration to auction radio spectrum.

The NTIA's plan, more detailed than similar proposals floated by White House administrations over the past eight years, calls for the Federal Communications Commission to auction off only available or newly appropriated radio spectrum.

Existing spectrum licensees would not have to bid for the spectrum they already use, a provision that would be welcomed by small users that cannot compete financially with large corporations for spectrum.

The NTIA proposal also calls for Congress to enact new legislation supporting the concept of spectrum auctioning because NTIA officials concede that the proposed plan violates the Communications Act of 1934, which does not recognize the rights of individuals or companies to own spectrum.

In its proposal, the NTIA calls on the FCC to implement the plan, urging it to immediately open up a rule making to establish a new system and procedures for spectrum allocation. The FCC would be allowed to determine which public interests should be excluded from any auctioning requirement.

NTIA officials believe the time has come to change the nation's spectrum allocation policy.

Instead of relying on FCC spectrum managers or lotteries to parcel out available frequencies, the NTIA is in favor of a process in which competitive bidding and spectrum resale are the primary means of allocating spectrum.

Janice Obuchowski, head of the NTIA, said it is time to introduce a market-based approach to spectrum allocation in order to encourage more efficient use of scarce radio spectrum.

The NTIA plan reasons that, through bidding, auctioned spectrum would find its fair price in the market and companies would determine its most appropriate use.

But in its report, the NTIA acknowledges that auctioning has no legal foundation at present. "As a matter of law, the 1934 act does not recognize spectrum property rights in licensees," the NTIA report stated, adding that all of legislative history "suggests that Congress did not view spectrum as something to be 'owned.' "

However, Obuchowski cautioned that under the NTIA's plan, spectrum property rights would still be subject to government control of licenses.

Obuchowski suggested that the revenues accrued in spectrum sales would help the public through increasing government revenues.

FCC Chairman Alfred Sikes recently expressed enthusiasm for spectrum auctioning. Therefore, should Congress enact the legislation requested by the NTIA, spectrum auctioning would likely be adopted.

Although little frequency is available for new allocations today, efforts by the FCC and Con-

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MCI adds advanced routing feature to its 800 service

ECR lets users customize call routing, messaging.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — In an effort to add value to its 800 services, MCI Communications Corp. last week unveiled an advanced call routing feature for voice processing systems in its public network.

The new feature, dubbed Enhanced Call Router (ECR) enables 800 service users to save money by customizing call routing and messaging capabilities supported in MCI's network. This obviates the need to buy on-premises voice processing systems to perform similar functions.

ECR has capabilities that include menu routing, message announcements, data base routing and busy/no answer rerouting. MCI outlined plans to offer these features last June ("MCI to roll out voice features," *NW,* July 2).

MCI is the second of the Big Three carriers to offer public network-based voice processing features for use with an 800 service. AT&T announced similar offerings based on its InfoWorks network platform in 1989.

"ECR is only the first in a new line of voice processing features we will offer to customers," said Rick Calder, 800 ECR product manager for MCI. The carrier plans to roll out voice recognition and additional recorded messaging features at some unspecified date.

ECR Menu Routing presents users with a menu of options for routing the call, enabling them to press a keypad number to choose a routing function.

> MCI is the second of the Big Three carriers to offer public net-based voice processing.
>
> ▲▲▲

Calls are answered by a voice processing system in the MCI network that plays a recorded message asking the caller to input single digits to advance to the next function or forward the call to a customer site.

ECR Message Announcement plays a prerecorded message for callers with information on service hours, site closings and alternate 800 numbers. Users can set this feature to terminate the call after the message or offer the caller other functions.

ECR Database Routing enables users to press keypad numbers in response to ECR Menu Routing voice prompts. After the number is keyed in, the call is routed to a customer location based on an MCI data base that maps caller routing requests to specific sites predefined by the user.

With ECR Busy/No Answer, calls are automatically rerouted to other extensions or to another ECR function, such as a recorded announcement, when the number dialed is busy or unanswered.

Users pay per-minute charges that cover the call from the point of connection until the time the caller hangs up. Customers with a dedicated access line to an MCI point of presence (POP) pay 15 cents per minute. Those with shared access — access lines that support a mix of 800 and WATS services — 800 business line access or Dial 1 access to an MCI POP pay 20 cents per minute.

> "ECR is only the first in a new line of voice processing features," Calder said.
>
> ▲▲▲

Users with mixed termination to an MCI POP, which is any combination of dedicated and shared access, pay 17.5 cents per minute. Customers must also pay per-call charges for each ECR feature. Users pay 3 cents per call for ECR Menu Routing, 8 cents per call for ECR Message Announcements, 9 cents for each time ECR Database Routing is used and 1 cent per call for ECR Busy/No Answer.

In addition, users whose audio storage for recorded messages exceeds 10 minutes must pay a onetime fee of $500 for each additional minute up to a maximum of 20 minutes. Users who change their message more than once a month must pay $150 for each message revision and $150 for each new message.

MCI will assist users in the creation of the ECR data base. If the data base is created from diskettes or other media, users pay $1,000 for the first 1,000 data base records and $750 for each additional 1,000 records up to a maximum of 10,000 records.

If the data base is created from hard-copy sources, users get the first 25 records free, pay $2,000 for 26 to 1,000 records and $1,500 for each additional 1,000 records up to a maximum of 10,000 records.

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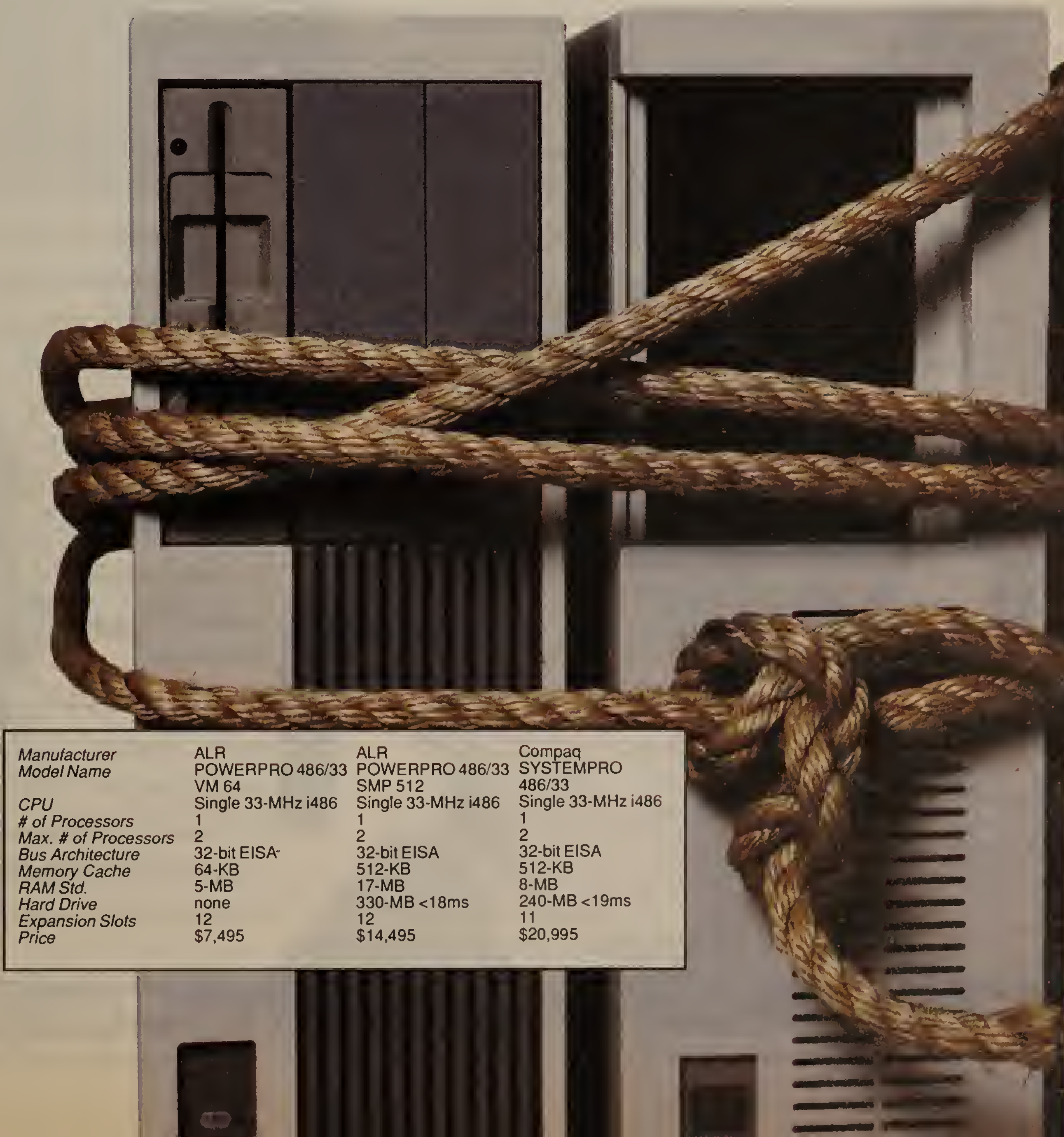

Manufacturer	ALR	ALR	Compaq
Model Name	POWERPRO 486/33 VM 64	POWERPRO 486/33 SMP 512	SYSTEMPRO 486/33
CPU	Single 33-MHz i486	Single 33-MHz i486	Single 33-MHz i486
# of Processors	1	1	1
Max. # of Processors	2	2	2
Bus Architecture	32-bit EISA	32-bit EISA	32-bit EISA
Memory Cache	64-KB	512-KB	512-KB
RAM Std.	5-MB	17-MB	8-MB
Hard Drive	none	330-MB <18ms	240-MB <19ms
Expansion Slots	12	12	11
Price	$7,495	$14,495	$20,995

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Group accepts 7 technology proposals

continued from page 2

systems, merge the data elements and return the report to the user.

Among the seven submissions that will vie to become the foundation for the OMG's ORB is a joint bid from arch rivals Hewlett-Packard Co. and Sun Microsystems, Inc.

Other entries came from Architecture Projects Management, Ltd., Digital Equipment Corp., DSET Corp., Group Bull, HyperDesk Corp. and NCR Corp.

The ORB will be the first specification developed in accordance with OMG's "Object Management Architecture Guide" (OMAG). Published last November, the OMAG defines a framework vendors can use to develop an object-oriented environment, which consists of an object-oriented language such as C++, a graphical user interface, distributed computing software and an object-oriented data base.

Several vendors are already building object-oriented environments. The goal of OMG's more than 100 vendor and user members is to define specifications developers can use to build applications that will run under any compliant object-oriented environment.

"Our intent is to have all of our members start singing from the same hymnal," said John Slitz, vice-president of marketing for OMG and a founder of NetWise, Inc., a supplier of RPC technology.

"The beginning of that hymnal is the idea of creating object-oriented environments that enable applications to communicate through standardized [application program interfaces], which constitute the ORB," he said.

Analysts applauded OMG's attempt to define standards for object-oriented environments and said the ORB could spur further interest in distributed computing by making it easier for one vendor's workstation to access objects stored on another's server.

"The pressure from users is to have applications that can run across a wide variety of different computing platforms, and this is a step on the way toward that," said Martyn Roetter, director of the information industries practice at Arthur D. Little, Inc. in Cambridge, Mass.

OMG's work will also go a long way toward helping vendors develop applications that can make use of one vendor's graphical user interface and another's object-oriented data base, said Tom Willmott, vice-president at the Aberdeen Group, a consulting firm in Boston.

In object-oriented environments, "the software and hardware packages from various suppliers will achieve a much higher level of interoperability than we've experienced in the past," Willmott said. "That is the key and fundamental benefit here."

In addition to submitting technology for the ORB, Sun and HP said they will work with standards bodies to develop a standard RPC for their respective distributed computing environments.

Sun's Open Network Computing (ONC) and HP's Network Computing System (NCS) software currently use different RPCs, meaning they will have to be revamped to work with the ORB until a standard RPC is adopted.

"What we've done is team up to ensure that what we're building has the flexibility to run across multiple RPCs," said Jeff Liotta, operation manager for HP's cooperative object computing division.

Neither firm would elaborate on the selection process for a standard RPC.

However, Liotta said the firms will not create a new standard that would contradict the groundwork that has already been laid, such as the Open Software Foundation's development of a standard RPC based on HP's technology. ◻

Nasdaq enlists MCI muxes to build net

continued from page 2

own links to Nasdaq data centers. Typically, he said, they only obtain point-to-point leased lines to the main data center.

As a result of this arrangement, disaster recovery capabilities suffer. More than three-quarters of the 85 firms that obtain special services do not maintain links to Nasdaq's backup data center in Rockville, Md. If the main data center goes down and Nasdaq has to shift operations to Rockville, subscribers to these special services would be cut off.

Outlining the new setup

Under the new network setup, special services subscribers will maintain dedicated links to the nearest MCI points of presence running at the same speed as the subscribers' existing links. Traffic then will be routed to one of six Network Equipment Technologies, Inc. (NET) IDNX multiplexer nodes throughout the country that will be owned, housed and maintained by MCI.

Two other IDNX boxes, also owned by MCI, will be housed at the Trumbull and Rockville data centers.

These NET nodes will be interconnected by a redundant T-1 and 64K bit/sec network based on a ring topology that will support automatic rerouting of traffic to the backup data center in the event of an outage.

"Our principle goal is to provide disaster recovery capability to our special services subscribers," Moore said.

According to Moore, the MCI network, worth an estimated $10 million over five years, was the least expensive way for Nas-

(continued on page 8)

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LEGENT

IBM to serve up surprise in rollout

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APPN is currently supported in full only on the Application System/400 and System/36 minicomputers, but last January, IBM said it would announce APPN support for OS/2 Extended Edition ("IBM to bring OS/2 into APPN family," *NW*, February 4).

That announcement will come this week and 3174 support will be unveiled as well, according to sources close to the company. IBM only acknowledged that its Communication Systems division will make an announcement Tuesday.

The sources expect IBM will announce the ability to configure a 3174 as an APPN network node — a node that maintains full routing tables in an APPN network. APPN end nodes do not maintain routing tables but can request routing information from network nodes.

Analysts say that as an APPN network node, the 3174 will be able to route traffic among LANs supporting OS/2 Extended Edition workstations equipped as APPN end nodes.

"A 3174, if it supported APPN, could be used as basically a low-end SNA router to link these LANs together — either over a backbone network or via direct links [between 3174s]," said David Passmore, a partner at Ernst & Young's Network Strategies, a consultancy in Vienna, Va.

The 3174 would only support IBM's LU 6.2 protocol, which is the only protocol IBM has announced that will work with APPN, Passmore said. Therefore, it will not enable users to link LANs using other protocols, such as Novell, Inc.'s IPX, over SNA nets. It will coexist with other protocols on the same LAN, however.

Inherent in the 3174 APPN announcement is another long-awaited enhancement — support for PU Type 2.1 on the 3174. PU Type 2.1 is a prerequisite for APPN.

That support will give users more flexibility in how they use personal computers attached to 3174s, analysts said.

"Today if you're attached to a 3174, the only application you can talk to is the host application," said Atul Kapoor, vice-president of Kaptronix, Inc., a Haworth, N.J., consulting firm.

The addition of PU Type 2.1 support would give the 3174 the ability to communicate as a peer with any other Type 2.1 node. It also means devices attached to the 3174 could support parallel sessions.

With parallel sessions, a device requires only a single logical unit definition in VTAM and NCP to support multiple sessions with other logical units. Today, if an OS/2 machine attached to a 3174 wants to conduct multiple sessions, it must have a logical unit configured in VTAM and NCP for each of those sessions, Kapoor said.

According to Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C., announced enhancements in the next release of VTAM will support dynamic allocation of logical units to PU Type 2.1 devices. That means a series of 3174s, if they supported APPN, could find the appropriate host at the request of an attached OS/2 Extended Edition machine. The OS/2 machine could then be assigned a logical unit by that host even though it was not predefined in VTAM. ◘

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Nasdaq enlists MCI muxes to build net

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daq to improve its disaster recovery capabilities. MCI will collect this money from brokerages and stock-quote vendors that obtain special services information. As a result, Nasdaq will incur no expense for the network.

Moore said that every special services subscriber will pay the same or less than they are currently paying for network services. He said savings would be largest for subscribers on the West Coast, who will no longer have to maintain dedicated circuits spanning the country. Users in this category could save more than 50%, according to Moore.

For their money, subscribers not only will obtain better disaster recovery capabilities, but better facilities management services as well. MCI will work with local carriers to provide access circuits and obtain modems for subscribers from Codex Corp., and also to monitor and maintain the network.

Moore said MCI beat out AT&T and Cable & Wireless Communications, Inc. by offering more attractive contract terms. For example, he said both AT&T and Cable & Wireless wanted Nasdaq to collocate equipment on the carriers' facilities.

This condition would have required Nasdaq to rent floor space, increasing costs further. By contrast, MCI agreed to use its own equipment to support the Nasdaq network, which enabled Nasdaq to avoid collocation charges and capital expenditures on new equipment.

Jonathan Crane, president of MCI's Eastern division, said MCI may use the Nasdaq network as a model for other users.

"We are the largest IDNX user in the United States," Crane said. "One thing we could do with our IDNX boxes is provision [network] applications to other users."

Crane said MCI currently operates a network of 114 NET IDNX T-1 muxes that support data communications between MCI data centers. Crane said MCI is considering allowing users to maintain dedicated data links between their own private networks and MCI's IDNX network. ◘

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

Novell, Inc. reported in a 1990 filing with the Securities and Exchange Commission that it spent about $59.3 million on product development in that year. That's up about 44% from the $41.3 million spent on product development in 1989, the report said.

People & Positions

Former FCC Commissioner **Patricia Diaz Dennis** last week was appointed vice-president of government affairs at **United Telecommunications, Inc.** and its **US Sprint Communications Co.** subsidiary.

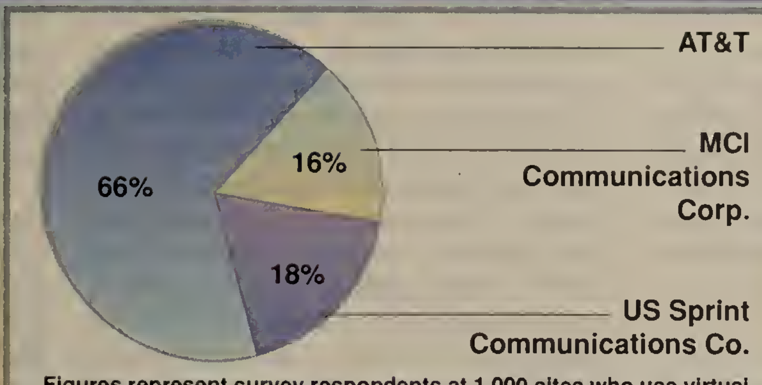
Dennis' major responsibilities will be to represent United Telecom and US Sprint before Congress and various federal government agencies on domestic, international and Federal Telecommunications System 2000 issues. She will also be involved in matters before the Federal Communications Commission.

Dennis served as a commissioner with the FCC from 1986 to 1989 and most recently was a partner in the law firm of Jones, Day, Reavis & Pogue in Washington, D.C.

Robert Puette, president of **Apple Computer, Inc.'s Apple USA** organization, last week was elected to the board of directors of **Cisco Systems, Inc.**, a Menlo Park, Calif., maker of internetworking products. Puette has been with Apple since 1980 when he joined to head its U.S. sales, marketing and support activities. Before that, he spent 24 years at Hewlett-Packard Co.

John Morgridge, president of Cisco, said that with Puette's experience in the personal computer local-area network business, he "will provide Cisco with valuable guidance as we expand our efforts in that area."

Virtual private network penetration



Figures represent survey respondents at 1,000 sites who use virtual private nets from a certain carrier.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: COMPUTER INTELLIGENCE, LA JOLLA, CALIF.

Start-ups poised to impress net users with new wares

Emerging companies may be future industry stars.

Despite tough economic conditions and intense competition among established vendors, observers believe there is still plenty of room for innovative start-ups to make their mark on the networking industry.

Emerging high-bandwidth applications, such as local-area network interconnection and imaging, have presented opportunities for some newcomers, while the growing intelligence of the public network will be exploited by other innovators.

Network World Senior Editors Bob Brown and Caryn Gillooly recently polled industry analysts, consultants and venture capitalists to compile this list of emerging companies that are likely to have a big impact on user networks in the years ahead.

Ascend Communications, Inc.

Based: San Francisco
Founded: 1988
Primary business: ISDN data communications access equipment and software

Ascend Communications, Inc.'s goal is to solve a perennial problem — users' lack of high-speed access to the public network.

Multiband is Ascend's flagship product. Introduced in January, the customer premises device uses Integrated Services Digital Network Basic Rate Interface, Primary Rate Interface or short T-1 'stubs' to provide high-speed access — up to 4M bit/sec — to the public network.

Multiband uses a technique known as inverse multiplexing to support such speeds. Like a multiplexer, Multiband divides bandwidth into channels but instead of sending one data stream per channel, it breaks up the data stream and sends it simultaneously over multiple channels. The stream is then reassembled at the receiving end.

By using, for example, six 56K bit/sec channels at once, a device has access to a virtual 336K bit/sec channel.

"The user sees one digital high-speed data stream," said Jay Duncanson, cofounder and product manager at Ascend.

Ascend has targeted four primary applications for Multiband, Duncanson said. They are videoconferencing, imaging, LAN bridging/routing and network back-up.

"Customers usually lease dual T-1 lines" for redundancy, which can get expensive, Duncanson said. With Multiband, however, the user has the option to lease only one private line and use the public network as a redundant path in case of disaster.

Pipeline

Ascend's other product, Pipeline, has been shipping since November 1990. It reduces the number of ISDN terminal adapters that hosts need to communicate with remote workstations. It passes data from multiple incoming ISDN circuits to a host, eliminating the need to install multiple-host ISDN adapters to support each remote workstation.

According to Duncanson, Pipeline is a rack-based system that can support as many as 500 terminal connections.

"Multiband is intended for a wide base of customers, while Pipeline is intended for ISDN campus installations," Duncanson said. "Pipeline is for large government installations, universities or advanced companies that have gone for full campus-wide ISDN."

According to Berge Ayvazian,

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Esrey predicts slow growth for US Sprint

Carrier's president and CEO briefs financial analysts on firm's cost controls, global push.

By Ellen Messmer
Washington Correspondent

NEW YORK — William Esrey, president and chief executive officer of United Telecommunications, Inc., recently told financial analysts to expect slower growth from US Sprint Communications Co. for some time to come.

At a meeting of investment analysts here, Esrey said US Sprint's revenue is likely to grow more slowly in coming quarters than it has in the past. But he vowed that the carrier, which is a joint venture of United Telecom and GTE Corp., will maximize its bottom line through tight cost controls.

William Esrey

Esrey said US Sprint would hold costs flat throughout 1991, but he cautioned that the weak economy and tough long-distance competition will be a drag on revenue and earnings. He added that US Sprint does not intend to capture new long-haul traffic through price slashing.

"I believe a company can pay too high a price to generate revenue growth," Esrey said. "Our challenge is to keep our perspective and not be captivated by the allure of growth for growth's sake. Our first priority is improving operating profits."

Esrey did not issue specific financial forecasts on revenue or profit for upcoming quarters.

In 1990, US Sprint achieved 17% growth in revenue for a total of $5.06 billion, compared with $4.32 billion in 1989. Minutes of usage also grew by 23%

(continued on page 10)

INDUSTRY BRIEFS

Groups make position known on RBHC ban. Three telecommunications equipment trade groups last week eased their opposition to a bill introduced recently by Sen. Fritz Hollings (D-S.C.) that would lift equipment manufacturing restrictions imposed on the regional Bell holding companies by the Modified Final Judgment.

In a proposal widely circulated on Capitol Hill, the Independent Data Communications Manufacturers Association, Inc., the North American Telecommunications Association and the Telecommunications Industry Association jointly issued a compromise position stating the ban on manufacturing be limited at this time to allow research and development.

The three groups also said they would not object to RBHCs being allowed to work jointly with other equipment makers nor would they balk at RBHCs being allowed to fund product development. The groups said further lifting of the manufacturing ban should not be considered until 75% of residential and business customers in a given RBHC territory have an alternative phone service available and 25% actually subscribe to an alternative service.

NCR establishes dealer program. NCR Corp. recently announced it is establishing the Gold Medallion Program to expand its dealer channels in 100 cities. Under the plan, NCR will team up with one dealer in each city to sell NCR equipment, including its high-speed local-area network, WaveLAN, and the NCR System 3000 computer systems. Dan Doster, NCR director of dealer sales, said his company will support the dealers through aggressive advertising, provide

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Esrey predicts slow growth for US Sprint

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during the year. But the carrier had only $148 million in operating profit vs. $227 million in 1989.

John Bain, an analyst with Raymond, James & Associates, said analysts are not entirely sure what's behind US Sprint's decline in profitability.

Bain said MCI Communications Corp. is able to make a fairly hefty profit. "It's not just industry conditions," said Bain, whose firm is predicting that the recession will limit this year's growth to 6% in the long-distance market.

> "While you won't see us rushing headlong into the international market, neither will you see us ignoring it," he said.

▲▲▲

Because United Telecom provides little line-item information regarding US Sprint's financials, details about the carrier's spending are unavailable. "We don't know where the problem is," Bain said.

Esrey told analysts that US Sprint has aggressive growth plans for the expanding global market. "Countries all around the world are modernizing their infrastructures," he said. "The opportunity is there to provide advanced voice, data and video services. It is essential that we position our company to take advantage of that growth."

However, Esrey was temperate in assessing the risks. He acknowledged that in the Soviet Union, where US Sprint and the Soviet Ministry of Posts and Telecommunications jointly own and operate a switching center for data communications, the outlook is politically uncertain at present.

Esrey said US Sprint would continue to invest in foreign ventures, although it would not consider investments in which US Sprint did not have significant ownership or control over operations.

"While you won't see us rushing headlong into the international market, neither will you see us ignoring it," he said.

The brightest note sounded in Esrey's address to analysts concerned United Telecom's seven local telephone companies. "Our local operating companies earned at or above the industry average last year," Esrey said, "and we expect that will continue in 1991."

Revenues from the local companies increased from $2.64 billion in 1989 to $2.72 billion in 1990, and operating income in 1990 totaled $650 million, up from $636 million in 1989.

But Bain cautioned, "They may be making money today, but they're not as valuable in the long term because they don't have their cellular component."

Bain said United Telecom sold off cellular communications rights years ago in order to finance US Sprint. He predicted that United Telecom will sell the seven companies in the future.

In an interview with *Network World*, Esrey discussed a number of additional issues, including delays in cutover to a new billing system dubbed Invoice Processing System (IPS). Esrey acknowledged that US Sprint had expected to have IPS cut over by now, but he predicted it will not be available until the end of the year.

Esrey said US Sprint will likely invest around $800 million this year in its network, slightly less than the $840 million it spent in 1990. He did not provide specific details of how the money will be allocated. In addition, he said US Sprint will announce the availability of international Virtual Private Network (VPN) services to new countries this year.

US Sprint expects to add "a handful" of new post, telegraph and telephone administrations to its list of international VPN supporters, he explained. ◘

Start-ups poised to impress net users

continued from page 9

vice-president of communications research at The Yankee Group in Boston, Ascend will face a wall of competition, not only from other small companies, but from the larger carriers as well. But Ascend is the first to market, he said, and they are the first to have the technology.

Ayvazian also said he was impressed by Ascend's awareness of the competition and what it must do to keep its place in the market. "They realize they have to play ball with the carriers," he said. "So, they're working closely with the carriers, and the equipment vendors and the T-1 [multiplexer] vendors," although he declined to be more specific.

Duncanson concurred. "We intend to make the [technology] available to the public," he said. "And we intend to make it a de facto standard using our technology."

BEYOND, Inc.

Based: Cambridge, Mass.
Founded: 1988
Primary business: E-mail-enabled applications software

Start-up Beyond, Inc. aims to make it easier for users to manage the exploding growth of electronic mail.

Within the next six months, Beyond plans to bring out BeyondMail, a front-end management tool for existing mail transport technologies, such as Novell, Inc.'s Message Handling System (MHS). Within the next three months, the company will release @Mail, which will let Lotus Development Corp. spreadsheet users send and receive E-mail from within the spreadsheet program.

BeyondMail uses a rule-based software engine that can automatically sort through incoming mail messages and forward, file or discard them according to the individual users' specifications. Using an icon-based interface, users can literally set rules regarding where certain messages should be sent.

A user can, for example, specify that if a message contains the word "urgent" it be filed in an urgent folder; or, if a message contains the words "I want" and "widgets," the user can specify that the message automatically be sent to the sales department.

The advantages of BeyondMail, according to Eugene Lee, Beyond's director of product planning, are that it is a front-end application based on the standards underlying mail transport technology and that it works with existing local-area network-based E-mail systems. The first version of BeyondMail is based on MHS. Future releases, Lee said, will be based on other mail transport technologies, such as the Open Systems Interconnection X.400 specification and other vendor-specific mail transport technologies.

"Our long-term focus is to establish a standard for rule-based messaging," Lee said.

According to Dave Atlas, senior analyst for electronic messaging at International Data Corp. in Framingham, Mass., "There's a big trend in E-mail toward client/server messaging, where different companies do the back-end [transport mechanisms] and different companies do the front end."

Beyond's other product, @Mail, is add-on software for Lotus' 1-2-3 and Symphony. According to Lee, with @Mail, users will be able to press a function key and pull up a window to access their mailboxes and send mail from within the spreadsheet applications.

"You can get user mail snapped into the Lotus spreadsheet," Lee said. "It's completely integrated. The user doesn't have to learn a new environment."

No flash in the pan

Analysts say it is not uncommon for early innovators to get quickly lost in a fast

Industry Briefs

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them with access to NCR's installed base of customers and conduct joint sales calls with resellers.

Consulting service formed. IBM and Coopers & Lybrand last week announced the formation of a new company, Meritus Consulting Services, which provide management consulting services to a broad range of manufacturers and will focus on makers of consumer package goods, pharmaceutical and health care companies.

Naming its consulting service Premier, Meritus will provide analyses of corporate manufacturing operations and will design computer-integrated manufacturing systems for installation.

Retix offers OSI licensing. Retix recently announced a new licensing program, the Corporate OSI Partners Program, under which manufacturers can license Retix's Open Systems Interconnection source code for a onetime fee. Retix said the program would allow large OEMs to purchase a package composing the firm's full suite of OSI protocols, instead of buying them a la carte. ◘

At this moment, Jim Adams is repo
account, printing a bill, and getting
from the RAM Mobile Data Networ

growing market. Lee, however, does not see Beyond suffering that flash-in-the-pan fate. "We made a strategic decision to stay out of the mail business," he said. "Mail vendors are big with feature wars and gateway wars. We're independent of all that.

"We're independent of the mail transport," he continued. "So not only is it easier to develop broad network acceptance, companies with heterogeneous back ends can standardize with us on the front end."

Coral Network Corp.

Based: Marlborough, Mass.
Founded: 1989
Primary business: High-speed LAN/WAN switches

Coral Network Corp.'s mission is to help users blend local-area networks and wide-area networks into all-encompassing enterprise nets.

"We're going to sit right on top of the dividing line between the LAN and WAN and we're going to try to erase the distinctions between the two," said Frank Bruns, Coral's senior vice-president of development and strategic systems.

Coral, whose management ranks include former employees of Proteon, Inc. (such as Bruns), Northern Telecom, Inc. and Prime Computer, Inc., among others, rolled out its first product in January ("Start-up to unveil hybrid T-3 mux, bridge/router," *NW*, Jan. 21).

Coral's Broadband Enterprise Switch, due to ship this summer, combines the functionality of a T-3 multiplexer, router and bridge, and will support emerging high-speed network standards such as Fiber Distributed Data Interface and Synchronous Optical Network.

The product was given a boost shortly after it was introduced when internetworking vendor Vitalink Communications Corp. announced that it would resell the Coral switch and make an equity investment in the start-up firm ("Vitalink to sell Coral switch as high-end router," *NW*, Jan. 28).

According to Bruns, Coral recognizes that it faces competition from established internetworking and WAN equipment vendors, as well as start-ups, such as T3plus Networking, Inc.

"The competition is stiff, but more so in sharing our mind-set than in providing capabilities," he said. "We believe we've made a leap in technology."

Rick Malone, a principal at Vertical Systems Group, a Dedham, Mass.-based market research firm, described Coral's hardware design as "powerful and impressive." He also applauded Coral's software development plans, though he noted that the software piece of Coral's switches has yet to be seen. But questions remain about how Coral will position its switch, Malone said.

Setting the focus

"Coral's market entry strategy lacks focus," he said. "Coral seems to be covering all the bases at the same time. Depending on whom you talk to at Coral, you'll hear that the switch is a souped-up router or that it's a networking T-3 mux."

But if Coral can focus its marketing strategy and deliver on the software it has promised, the firm has the potential to carve itself a lucrative niche, Malone said.

T3plus Networking, Inc.

Based: Santa Clara, Calif.
Founded: 1988
Primary business: High-speed backbone network multiplexers

T3plus Networking, Inc. has set its sights on the emerging market for T-3 and higher speed networks.

"We are focusing on leadership in the T-3 market and are moving in the [Synchronous Optical Network] direction," said Alan Menezes, T3plus' director of marketing. "[Users] will feed T-1s into our products via other vendors' muxes and feed LANs into our products via routers."

Menezes believes the T-3 market is poised for rapid growth, given the emergence of high-bandwidth applications such as imaging and LAN interconnection.

"Anything below T-1 is a commodity market," he said.

T3plus received good reviews from industry observers when it unveiled a line of competitively priced T-3 multiplexers in January ("Mux mart newcomer airs low-end T-3 box," *NW*, Dec. 31, 1990/Jan 7, 1991).

The new BMX45 T3 Bandwidth Managers, which offer users the flexibility to support channels of any bandwidth between T-1 and T-3, are being beta-tested now and should become generally available later this month.

The BMX45, which supports one or two T-3s, is well-positioned to meet the needs of users beginning the migration to T-3, observers said.

"T3plus is a very nicely focused company," said Steve Taylor, a principal at Distributed Networking Associates, a telecommunications planning and research firm in Greensboro, N.C. "They've identified a market niche."

But Taylor warned that T3plus will be challenged by established multiplexer firms heading in the same direction.

"[T3plus'] product is a good idea, but not a unique idea," Taylor said. "As others begin to roll out similar products, T3plus will need to be ready to move forward with SONET compatibility."

Menezes recognizes that competition will come from many directions. But he said T3plus has an edge over traditional players in that its products are "built from the ground up" to support T-3, while established players have tried to support T-3 simply by stretching their existing T-1 architectures.

Sticking to the basics

"We plan to stick to the basics of T-3 networking and expand from there," Menezes said.

Rather than building routing capability into the BMX45, for example, T3plus plans to provide links to other vendors' routers and let the router vendors do what they do best, Menezes said.

The company fully expects its products to be used in multivendor networks in conjunction with a multitude of other vendors' routers, multiplexers and other equipment, he said.

Unifi Communications Corp.

Based: Billerica, Mass.
Founded: 1989
Primary business: Call management software for public networks

Bob Pokress, president and chief executive officer of Unifi Communications Corp., said he "cracked up laughing" when a speaker at a recent trade show labeled him "an industry renegade."

But Pokress said the description is apt when discussing his involvement with Unifi, the call processing and management software firm he cofounded in 1989 after spending time at the laboratory divisions of AT&T and GTE Corp.

"We're doing something very different," Pokress said. "We're positioning our software as an end-user network operating system for the public network."

Unifi has yet to announce many details about its PhoneServer product, which just entered beta-testing and will be generally available by midyear.

Basically, PhoneServer is a client/server software package designed to run on Unix-based servers supporting a variety of client computers running Microsoft Corp.'s Windows 3.0.

Among the initial applications for PhoneServer, Pokress said, will be creating distributed automatic call distributor (ACD) systems that utilize the intelligence of the public network rather than a stand-alone ACD device located at the customer site.

The Unifi software would enable calls into an airline reservation network, for example, to be transferred to agents at client workstations anywhere on a network. This differs from current private branch exchange-based or stand-alone ACD systems, which generally confine ACD functions to a particular site, Pokress said.

With built-in support for public telephone network standards, such as Integrated Services Digital Network, Unifi's product is designed to enable users to build applications on Unix servers that can share information across the public network, Pokress said.

"We're out to eliminate the tyranny of proprietary hardware that customers have been saddled with from [telecommunications] equipment vendors for the past 20 years," Pokress said.

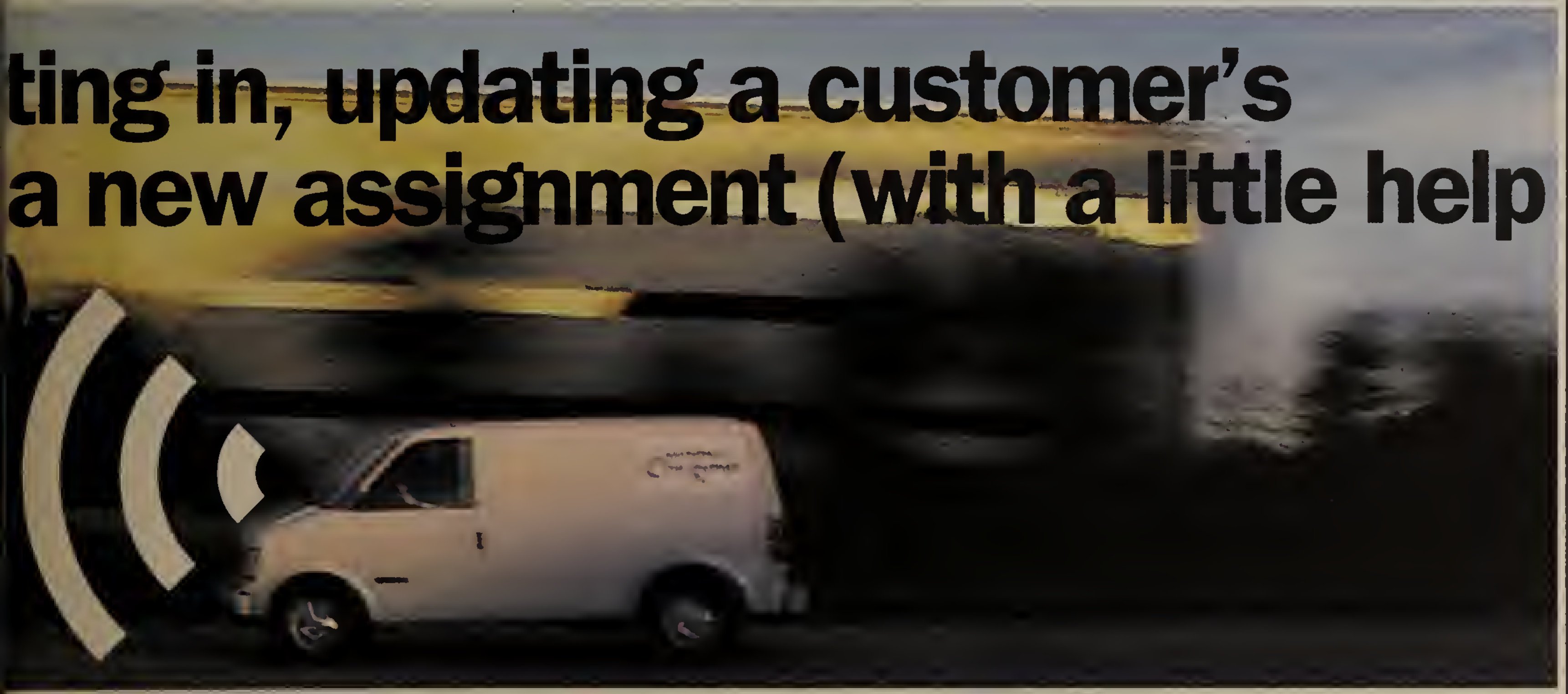
Unifi is trying to give users more control over the public network, said Mary Johnston-Turner, a principal at Northeast Consulting Resources, Inc. in Boston.

"[Unifi] has recognized that there is a role for the public network to play in corporate networks," she said.

Paris Burstyn, an analyst at Business Research Group, a Newton, Mass., market research firm, agreed. "Unifi is right that users are moving more traffic to the public networks off of their private networks" to take advantage of virtual private networks and other attractive new public network offerings, he said.

A concern, however, is that Unifi's future may be tied too closely to the carriers' rollout of advanced network capabilities, such as ISDN, he said.

"The LECs can be slow horses to tie your sled to," Burstyn said.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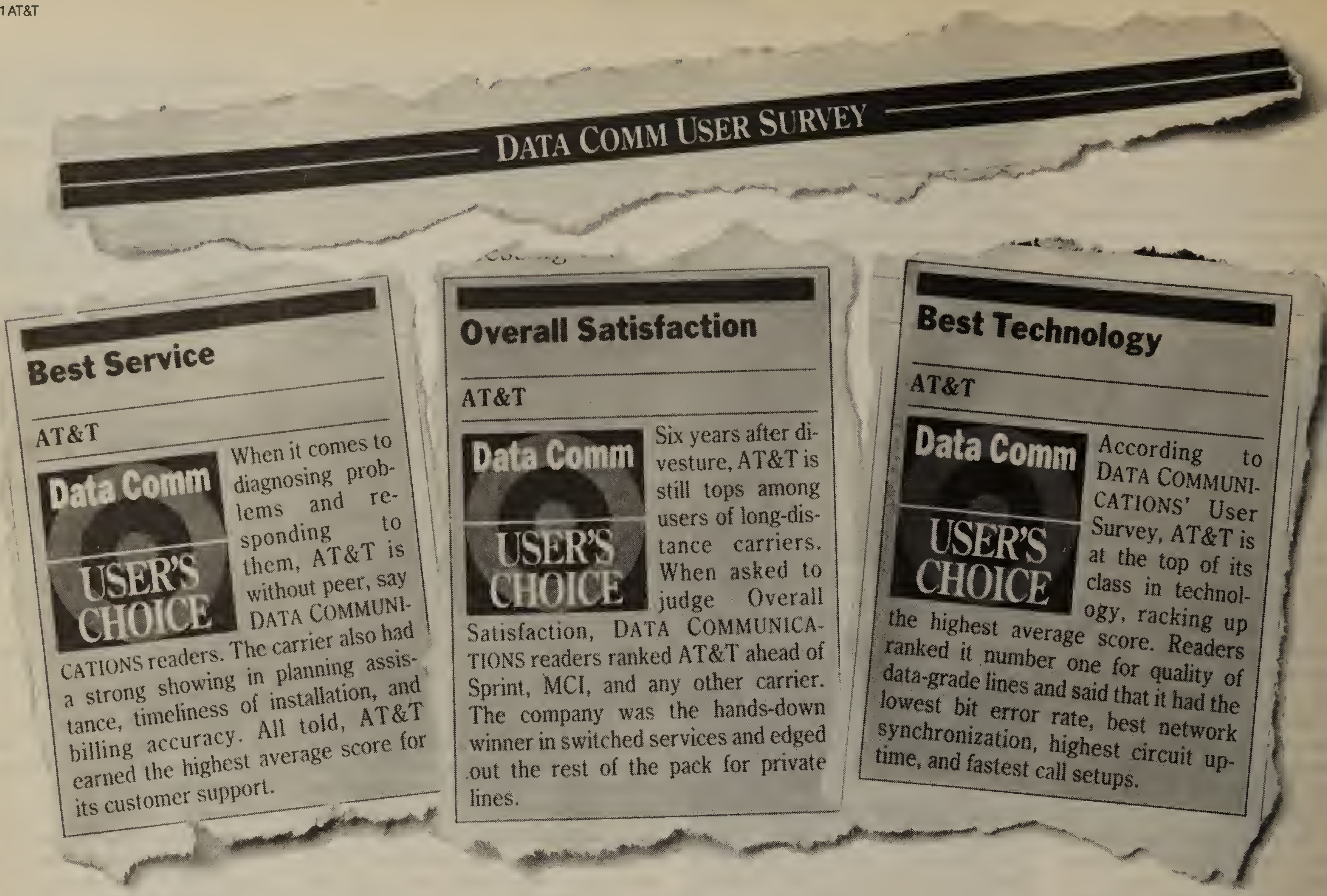

DATA COMM USER SURVEY

Best Service

AT&T

When it comes to diagnosing problems and responding to them, AT&T is without peer, say DATA COMMUNICATIONS readers. The carrier also had a strong showing in planning assistance, timeliness of installation, and billing accuracy. All told, AT&T earned the highest average score for its customer support.

Overall Satisfaction

AT&T

Six years after divesture, AT&T is still tops among users of long-distance carriers. When asked to judge Overall Satisfaction, DATA COMMUNICATIONS readers ranked AT&T ahead of Sprint, MCI, and any other carrier. The company was the hands-down winner in switched services and edged out the rest of the pack for private lines.

Best Technology

AT&T

According to DATA COMMUNICATIONS' User Survey, AT&T is at the top of its class in technology, racking up the highest average score. Readers ranked it number one for quality of data-grade lines and said that it had the lowest bit error rate, best network synchronization, highest circuit uptime, and fastest call setups.

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- Best planning assistance.
- Best circuit quality—voice.
- Best circuit quality—bit error rate.
- Best circuit quality—network synchronization.
- Best circuit uptime/month.
- Best call set-up speeds.
- Best problem diagnosis/response time.
- Best billing accuracy.
- Best overall satisfaction.

In Private Line Services:

- Best circuit quality—data.
- Best circuit quality—bit error rate.
- Best circuit quality—network synchronization.
- Best circuit uptime/month.
- Best call set-up speeds.
- Best problem diagnosis/response time.
- Best billing accuracy.
- Best overall satisfaction.

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STREET ADDRESS ....

CITY .... STATE .... ZIP ....

C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government State/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ____________

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporate Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ____________

3 What is the scope of your involvement in purchase decisions for Network/Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwave
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ____________

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09. ☐ NOVELL (NETWARE)
10. ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ____________

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ 10BASET
9. ☐ OTHER ______

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8 ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ____

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently Installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am presently involved in the purchase process for the following products/services:

B) I plan to purchase the following products/services in the next 12 months:

Presently Involved A	Plan to Purchase B	
		LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers

(continued on next column)

Presently Involved A	Plan to Purchase B	
		SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Software
23. ☐	☐	Applications Software
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packet Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Test Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adapter Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Software
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54 ☐	☐	Dedicated Leased Line
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packet Switched
59. ☐	☐	Centrex
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?

B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B
1 ☐	☐ $100 million and over
2 ☐	☐ $50 - $99.9 mill
3 ☐	☐ $25 - $49.9 mill
4 ☐	☐ $20 - $24.9 mill.
5 ☐	☐ $10 - $19.9 mill.
6 ☐	☐ $5 - $9.9 mill.
7 ☐	☐ $1 - $4.9 mill.
8 ☐	☐ $500,000 - $999,999
9 ☐	☐ Under $500,000

18 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rate Interface Terminal Adapters
2. ☐ Primary Rate Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will you consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ____________

NETWORK WORLD
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91NN

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

MCI Communications Corp.'s nationwide network is 38% fiber, 27% digital microwave and 35% analog microwave. The network uses 41 Northern Telecom, Inc. switches, 41 Digital Switch Corp. switches, eight Rockwell International Corp. switches and three Ericsson, Inc. switches.

Carrier Watch

Pacific Bell and Tandem Telecommunications Systems, Inc. (TTSI) recently announced plans to evaluate the feasibility of using the advanced intelligent net (AIN) concept to offer customized services to large users.

The goal of AIN is to create standards that will enable telephone companies to mix and match information processing and switching components to provide advanced services, instead of being at the mercy of a few central office switch suppliers.

Part of that initiative calls for off-loading some signaling and intelligence processes from switches into special adjunct processors. TTSI makes such adjunct units.

In the project, both parties will evaluate AIN and conduct a series of studies with customers to determine the scope of their needs and acceptance of prospective AIN-enabled services. The tests will be conducted from Pacific Bell's technology laboratory in Concord, Calif., using TTSI's Service Control Point and Service Creation Environment, the latter of which is an application development tool.

The two companies are still developing the specifics, but they said the effort may result in the creation of a call-forwarding service that could be used in a number of ways.

(continued on page 15)

Dow Chemical safeguards call center with AT&T help

Megacom 800 feature protects against outages.

By Bob Wallace
Senior Editor

Wary of the havoc a switch failure would wreak on its national call center, Dow Chemical U.S.A. partnered with AT&T to develop an advanced 800 routing feature that will enable it to survive this type of disaster.

The Megacom 800 service feature, which AT&T now offers commercially as Split Access Feature Egress Routing (SAFER), helps further safeguard Dow's call center from downtime. The center is used to field calls from around the country.

SAFER is designed for customers with a single call center supported by T-1 access from a single AT&T 4ESS switch. With the feature, if the customer's primary serving center cannot complete calls over the T-1, they are routed to another 4ESS switch and delivered over a separate T-1 line.

In early 1989, Dow consolidated its many far-flung sales and service centers into a single call center in Midland, Mich. After that, it met with AT&T, its primary 800 service provider, to develop a means of protecting the center from problems that would knock out the 4ESS serving switch in Lansing, Mich. The center handles 25,000 incoming calls a month.

"The Lansing 4ESS became a single point of failure for our entire sales and service operation, so we created a task force of Dow and AT&T [representatives] to come up with a plan to protect the center from a switch outage," said Michael Hewitt, U.S. telecommunications manager for Dow. "They worked with us as part of a strategic partnership we have with them."

With strategic partnerships, users select one or two preferred network vendors from which they purchase most services and equipment under multiyear contracts. For their commitment, the customers are ensured the lowest possible prices and a higher level of service and support than that provided to other buyers.

AT&T came up with SAFER and equipped its 4ESS switch in Detroit to automatically route Dow's 800 calls over a separate T-1 to its Midland call center in the event that the Lansing switch was damaged or knocked out of

(continued on page 15)

WASHINGTON UPDATE

BY ANITA TAFF

Sikes defends FCC budget. FCC Chairman Alfred Sikes went to Capitol Hill last week to defend his budget request for fiscal 1992. If approved, the request of $133.4 million, up 15% from the 115.8 million allotted for fiscal 1991, will be the highest level of funding in the agency's history. The increase would also represent the largest percentage jump in funding ever given to the agency.

Sikes said that about half of the increase over the 1991 budget is needed for nondiscretionary spending such as growth in operating costs and increased employee compensation stemming from recent and projected federal pay raises.

Much of the remainder of the money will be used to improve operations. For example, Sikes wants to add 38 employees to handle common carrier matters, including tariff processing, mobile radio and international services. The agency has been under increasing pressure to handle the "exponential increase" in the number of common carrier actions, he said.

Sikes said additional funding is also needed to upgrade computer systems. "Our systems today are just barely adequate to handle rudimentary tasks," he told Congress. "We lack the ability of several other agencies to accommodate electronic filing, a step that would both reduce our burdens and, more importantly, better serve the public."

FCC delays satellite decision. FCC officials said last week that the agency will hold off on a final decision about whether to allow new satellite carriers to provide switched

(continued on page 15)

Rate cases completed by state regulators

	Revenue requested (in millions of dollars)	Rate changes ordered (in millions of dollars)
1989		
First quarter	$85.7	($203.7)
Second quarter	0.2	(107.6)
Third quarter	21.2	(48.9)
Fourth quarter	74.6	(478.3)
Total	**$181.7**	**($838.5)**
1990		
First quarter	$54.7	($134.6)
Second quarter	6.8	(109.9)
Third quarter	4.6	(316.9)
Fourth quarter	832.0	110.3
Total	**$898.1**	**($451.1)**

SOURCE: FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON, D.C.
GRAPHIC BY SUSAN J. CHAMPENY

Intrastate rates rise in 4th-quarter 1990

First quarterly increase in three years, but prices for the full year decrease $451 million from 1989.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — State regulators ordered an increase in intrastate rates in the fourth quarter of last year, the first quarterly rate increase granted in three years. For the year, however, local carriers were required to cut prices by $451 million.

According to a recent report issued by the Industry Analysis Division of the Federal Communications Commission, state regulators across the country allowed a total of $110.3 million in price increases during the fourth quarter last year. This was the first time that the amount of local rate increases exceeded overall decreases since the fourth quarter of 1986.

A good barometer

Pending rate cases provide a good barometer for rate trends during the next year, according to the FCC division, which prepared the report. But the rate increases at the end of last year may be a onetime anomaly and not a trend toward higher local rates.

The vast majority of the fourth-quarter increase occurred in New York, where local regulators allowed a $250 million increase after a five-year moratorium on rate hikes ended last year. New York Telephone Co. had requested an $832 million increase and wrangled with state regulators for almost one year to receive only one-quarter of that request.

In almost 30 states, regulators are beginning to experiment with price cap-style regulation. Many observers believe this will help hold prices down because prices are capped and because many of the plans include a mechanism through which carriers must share excess profits with ratepayers.

In other states, such as Massachusetts, regulators are looking into ways to force rates closer to cost. After conducting a five-year study, the Massachusetts Public Utility Commission determined that New England Telephone and Telegraph Co. was charging rates that were higher than the cost of providing service and ordered a large rate reduction.

Local access charges were cut by 40% and business class rates were cut 10%, although residential rates were allowed to rise in some areas.

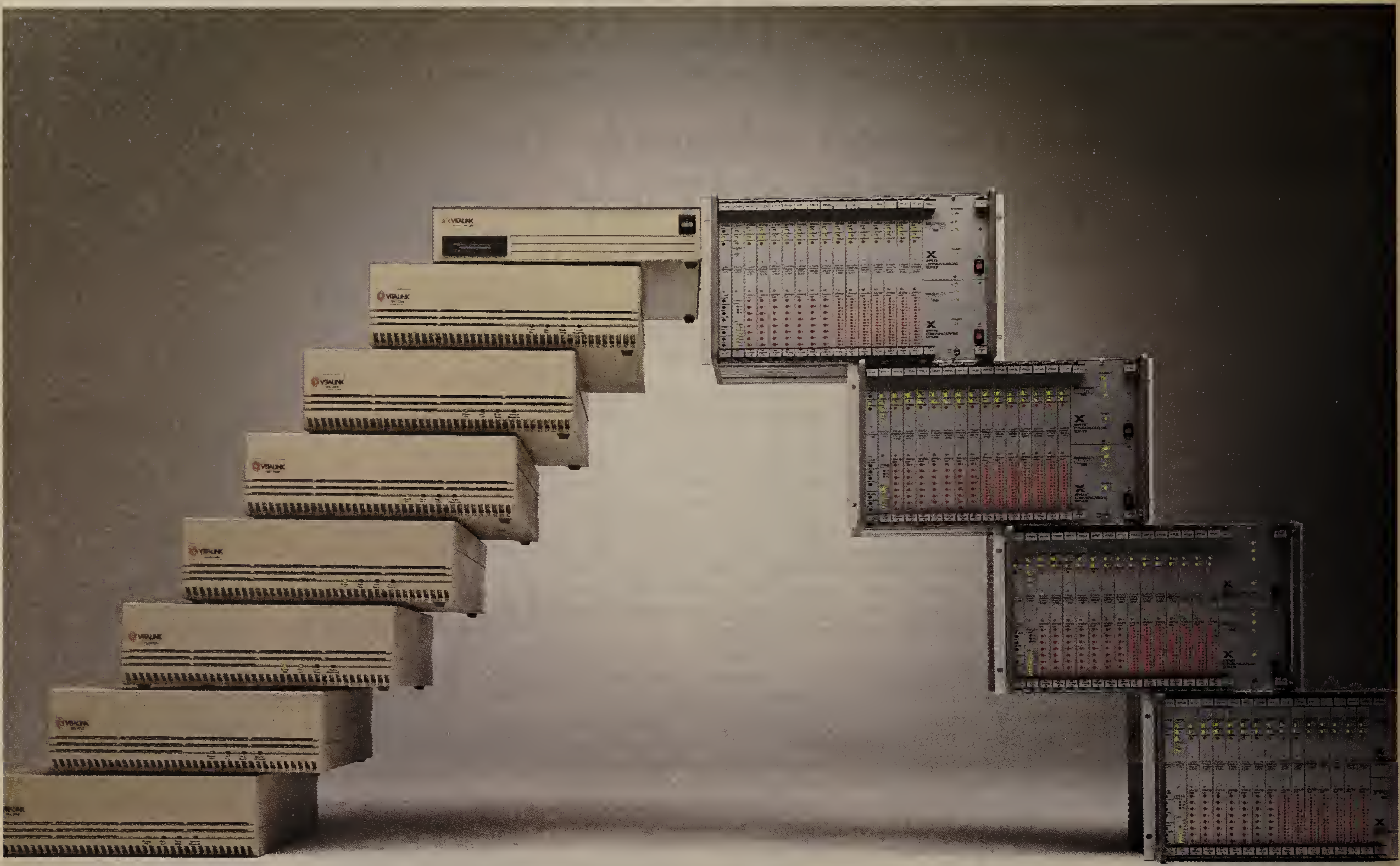
Also this year, the FCC threw out $1.6 billion from local carriers' access rates, saying the firms had included inappropriate items, such as Capitol Hill lobbying costs, or had inflated revenue needs.

Last year, local carriers across the country requested rate increases totaling $898.1 million but instead were ordered to cut prices by $451.1 million. In 1989, carriers requested rate increases of $181.7 million but were ordered to cut rates by a whopping $838.5 million.

State regulators dispensed with the bulk of rate cases pending last year, leaving only $258.6 million in requests uncompleted.

The FCC compiles data from the Bell operating companies, GTE Telephone Operations, United Telecommunications, Inc. and Contel Corp.

(continued on page 15)



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BRNW2

XYPLEX

Carrier Watch

continued from page 13

For example, the service might allow users to program a daily itinerary into the Service Control Point so that calls could follow them from site to site. They might also be able to specify the telephone numbers of callers whose calls they would like to have forwarded.

Pacific Bell and TTSI are working with AT&T Network Systems Group and will be using its 5ESS for initial testing. Pacific Bell, however, will evaluate the capabilities for use across all of its switches.

TTSI is a wholly owned subsidiary of Tandem Computers, Inc.

Prime Computer, Inc. last week acknowledged it has awarded **US Sprint Communications Co.** a three-year, $15 million contract that designates the carrier as its exclusive voice and data services provider.

Under the contract, Prime will use SprintNet packet-switched data services, its Clearline T1.5, Virtual Private Network, FONLine 800, Ultra800 and FONcard services.

US Sprint has also created an employee benefits program under which Prime employees will receive substantial discounts through combined service usage with the company.

Blue Bell Creameries, Inc. last week acknowledged it has awarded **Metromedia Communications Corp.** a contract for a variety of long-distance services for use at its 18 Southwest offices.

The ice cream manufacturer will use the carrier's Precision and Six-Second Dial-Up basic long-distance services with Metromedia's Corporate Billing feature, which provides a single bill for all customer locations.

The companies declined to detail the length or value of the contract. ◻

Intrastate rates rise in 4th-quarter 1990

continued from page 13

These firms carry about 90% of all local traffic in the U.S.

State regulators virtually ignored requests for rate increases this year, instead ordering a variety of direct rate decreases and other rate-reducing programs including customer credits, elimination of taxes, restructuring of service costs and revenue-sharing plans for users.

Other increases

Although there was a large rate increase allowed to New York Telephone, more moderate increases were granted in a handful of states. Regulators granted GTE North in Michigan a $13.7 million increase, and New England Telephone won a $11.6 million increase in New Hampshire.

But even those instances of rate increases were small victories since the carriers had both requested about double the amount granted. GTE had asked for an increase of $22.8 million in Michigan, and New England Telephone asked for $21 million in New Hampshire.

Carriers had requested rate increases in only six other states — Iowa, Missouri, New Hampshire (Contel), South Carolina, Tennessee and West Virginia — and all of the requests were for less than $10 million. State regulators granted $2 million or less in each of those instances. ◻

Washington Update

continued from page 13

international service until other agencies can weigh in on the matter.

Richard Firestone, chief of the FCC's Common Carrier Bureau, said the agency has notified the U.S. Department of State and the U.S. Department of Commerce that it will not act on a recent Pan American Satellite Corp. (PANAMSAT) petition to liberalize international satellite rules to allow for provision of switched traffic.

Under rules established six years ago, only the International Telecommunications Satellite Organization is allowed to interconnect with the public switched network and provide switched service.

Although the FCC is considering PANAMSAT's petition for a rule change, officials from the State Department and the Commerce Department recently asked the FCC to not move ahead until they have determined the international impact and can issue a recommendation, which is expected to be delivered in May. Communications Satellite Corp., the U.S. representative to INTELSAT, questioned the FCC's authority to act unilaterally in any rule change. ◻

Dow safeguards call center with AT&T

continued from page 13

service, Hewitt said. The carrier has since equipped other 4ESS switches to support SAFER.

Dow has had the capability to use SAFER since September 1989 but has not yet needed it. "SAFER gives us a great deal of comfort and backup," Hewitt said.

As part of its partnership with AT&T, Dow persuaded AT&T in September 1990 to build a dedicated point of presence in Midland for data services because the nearest network entry point at the time was more than 20 miles away, Hewitt said.

"This was a substantial investment by AT&T in helping reduce risk in our [call center] operations and was in keeping with our stated need for route diversity," Hewitt said. ◻

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- **3270 EMULATION**—CQ Computer Communications; NSA; Attachmate; Black Box; Sterling Software
- **5250 EMULATION**—CQ Computer Communications; Black Box; Emerald
- **X.25**—Microdyne; NSA
- **UNIX, XENIX, AIX**—The Santa Cruz Operation; Cleo; Serengeti Software
- **REMOTE JOB ENTRY**—CQ Computer Communications; Serengeti Software; Eastham Assoc.; Sterling Software; Barr Systems; NSA; Black Box; Cleo
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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

Citicorp recently said it will link 1,430 of its 1,800 automated teller machines to Cirrus System, Inc.'s national network, thus enabling its ATM cardholders to use Cirrus ATMs and Cirrus cardholders to use Citicorp ATMs for the first time.

Data Packets

GE Information Services last week announced the availability of 9.6K bit/sec synchronous dial-up access to its value-added network from 12 U.S. and 12 European cities.

Previously, 9.6K bit/sec synchronous access was available only via leased lines and synchronous dial-up access was limited to 2,400 and 4.8K bit/sec.

The dial-up capability will offer the advantages of higher speed access to users with limited hardware resources or with volumes too low to justify leased lines.

The 9.6K bit/sec synchronous access supports 2780/3780 Binary Synchronous Communications, 3270 BSC, 3270/3770 Systems Network Architecture devices and IBM's LU 6.2.

The Missouri Highway and Transportation Department recently purchased **T4 Systems, Inc.**'s T4 Link facsimile server. The department takes calls from truck drivers seeking permits to move overweight or oversize loads through the state. Currently, between 200 and 500 permits per day are manually faxed to truck drivers or trucking companies.

With T4 Link, department employees using IBM 3270 terminals attached to a 3090 or 4381 mainframe will be able to enter the proper recipient fax number and send the permit from their terminals. ◼

US Sprint's fractional T-1 rate proposal

Bandwidth (bit/sec)	Intercity circuit mileage	Fixed charge per circuit		Charge per intercity circuit mile	
		Old*	New*	Old	New
112K	1-50	$121	$126	$4.68	$4.88
	51-100	248	258	2.16	2.25
	101+	413	430	0.48	0.50
168K	1-50	178	185	6.89	7.18
	51-100	366	381	3.18	3.31
	101+	609	634	0.71	0.74
224K	1-50	237	247	9.18	9.56
	51-100	487	507	4.23	4.41
	101+	810	844	0.94	0.98
280K	1-50	284	296	10.97	11.43
	51-100	583	607	5.06	5.27
	101+	970	1,010	1.13	1.18
336K	1-50	358	373	13.83	14.41
	51-100	735	766	6.39	6.66
	101+	1,223	1,274	1.42	1.48
392K	1-50	407	424	15.67	16.32
	51-100	833	868	7.23	7.53
	101+	1,385	1,443	1.61	1.68
448K	1-50	455	474	17.56	18.29
	51-100	933	972	8.10	8.44
	101+	1,552	1,617	1.81	1.89
504K	1-50	511	532	19.68	20.50
	51-100	1,047	1,091	9.09	9.47
	101+	1,740	1,813	2.03	2.11
560K	1-50	538	560	20.74	21.60
	51-100	1,103	1,149	9.57	9.97
	101+	1,834	1,910	2.13	2.22
616K	1-50	621	647	23.95	24.95
	51-100	1,274	1,327	11.05	11.51
	101+	2,117	2,205	2.46	2.56
672K	1-50	677	705	26.08	27.17
	51-100	1,387	1,445	12.04	12.54
	101+	2,306	2,402	2.68	2.79

Old* - Oct. 1989
New* - Effective March 3, 1991

GRAPHIC BY SUSAN SLATER SOURCE: FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON, D.C.

Primary Access adds PAD to network access system

Sixteen-port card provides X.25 interface to nets.

By Paul Desmond
Senior Editor

SAN DIEGO — Primary Access Corp. last week announced the addition of a 16-port packet assembler/disassembler to the existing channel bank and modem capabilities of its integrated network access system.

The Primary Access network access system, based on a chassis with an internal bus, replaces modems, channel banks and now PADs. The channel bank and modem functions let users employ digital T-1 services such as AT&T's Megacom 800 to support remote dial-up modem users.

A new 16-port Data Communications Processor (DCP) card will add a PAD capability to give the product an X.25 interface to host computers, public packet nets and private T-1 networks, said Robert Berlin, director of marketing at Primary Access.

Primary Access also announced that The Travelers Corp. of Hartford, Conn., will be the first user of the new PAD function. The Travelers plans to use the new function to support the thousands of independent insurance agents who dial into its mainframes, Berlin said.

One of the main benefits of the Primary Access system is that it lowers line costs for users by allowing them to use digital services such as Megacom 800 and Feature Group B. These offerings can be accessed via a T-1 line and are more cost-effective than comparable analog services.

"The economics of terminating dial modem traffic over Megacom is a no-brainer," Berlin said. "There's about a three-month payback for modest applications and even less for large networks."

According to Primary Access, a user with 24 AT&T 800 Service analog lines used six hours a day would save more than $15,000 monthly by switching to Megacom 800.

The new PAD takes that a step further by not only letting the Primary Access system accept digital T-1 lines from carriers, but also by giving it the ability to output a single high-speed V.35 bit stream. Previously, a separate RS-232 connection was required for each channel supported by the Primary Access system.

(continued on page 18)

Users tackle concepts of DECnet Phase V

Addition of OSI to product forces customers of DECnet Phase IV to master new terminology.

By Jim Brown
Senior Editor

LITTLETON, Mass. — Users gearing up to migrate from Digital Equipment Corp.'s DECnet Phase IV to the Open Systems Interconnection-based DECnet Phase V must not only master the architectural shift, but also the terminology used to describe it.

Its support for OSI protocols is forcing DEC to introduce a number of new terms and concepts into DECnet Phase V.

For instance, DEC is helping users understand domains and subdomains and how they compare to DECnet areas, according to Steve Kelly, a DEC network consultant who assists customers preparing DECnet Phase V migration strategies.

Under DECnet Phase IV, users can split a network of as many as 64,000 nodes into 63 areas, or subnetworks, of 1,023 nodes each.

DECnet Phase IV also provides a mechanism for interconnecting DECnet areas via a backbone network so nodes in different areas can communicate.

But under DECnet Phase V, networks will be broken into multiple routing domains that can be managed as a single administrative domain. Routing domains shuttle traffic between subdomains, which are analogous to DECnet Phase IV areas.

This setup would enable a company to build a network as a single administrative domain and place subsidiaries and operating units into their own routing domains, each consisting of multiple subdomains.

Network managers can then decide whether users in the different routing domains will be able to communicate with one another. They can also determine whether nodes in the administrative domain would be able to communicate with nodes of another company.

These DECnet Phase V concepts are supported by DEC's adoption of OSI's addressing scheme, which enables users to build networks supporting hundreds of thousands of nodes.

"Phase V will let you have thousands of areas with thousands more nodes per area," Kelly said. "What you'll also have is more choice to segment your network to match the way your company or agency is organized."

What used to be called simply an address in DECnet Phase IV is now referred to as a Network Service Access Point (NSAP) in DEC-

(continued on page 18)

Start-up plans backbone for credit transaction net

By Paul Desmond
Senior Editor

HERNDON, Va. — Transaction Communications, Inc. (TCI) recently announced that it is building a nationwide backbone based on Netrix Corp. circuit/packet switches to support its new public transaction processing net.

The company expects its new backbone to provide credit transaction services that are faster or less expensive than similar services used by prospective clients.

TCI is a start-up that currently serves four East Coast cities and plans to expand nationwide by the end of the year. Its primary marketing focus is credit card authorization transactions, but the network will also support check authorizations and medical or pharmaceutical claims.

TCI's net will initially consist of five Netrix #1-ISS circuit/packet switches, said Craig Stutzman, TCI's vice-president of network operations. Those five nodes will support traffic coming from 21 devices that act both as channel banks and packet assembler/disassemblers, he said.

Point-of-sale terminals used to initiate credit card authorizations will use a local exchange carrier's Feature Group B service, which means they dial a seven-digit number to be connected to a local carrier's switch. The carrier will combine as many as 24 such calls, each of which is transmitting data at 300 to 1,200 bit/sec, onto a T-1 circuit. The T-1 line will feed into the channel bank/PAD, which will be collocated at the carrier's central office, according to Brian Bates, di-

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Start-up plans backbone net

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rector of sales at TCI.

The PAD will wrap the data in an X.25 packet and hand it off to the nearest Netrix switch via a 56K bit/sec leased line.

The 56K bit/sec backbone will also provide the connection to the appropriate host.

For credit card authorizations, Bates said, the TCI approach is more efficient than the two approaches used today.

Some companies use WATS lines to connect to a host, and the average connect time is 20 to 30 seconds, according to Bates. "TCI, end-to-end, can do the approval process in six to eight seconds," he explained.

The other alternative commonly used is to connect the POS terminal to a public packet network, which offers a response time of about 15 seconds.

Excluding local access charges, he said, TCI could offer leased lines for 20% to 30% less than what any of the three major carriers charge. ◼

Users tackle Phase V concepts

continued from page 17

net Phase V. The NSAP is up to 160 bits long, vastly larger than the 16-bit DECnet Phase IV address. The NSAP consists of an Initial Domain Part (IDP) that defines the administrative domain a node belongs in and the Domain Specific Part (DSP), which is the actual node address.

"The IDP is a new, third dimension of addressing being introduced into DECnet," Kelly said. It is basically a unique network number that defines a company's OSI-based network. The number must be obtained from one of five international standards bodies responsible for overseeing the use of IDP addresses for public and private networks.

"Generally, Phase IV assumes the network is within the same company or agency," Kelly said. "What OSI and Phase V do is facilitate the construction of intercompany or interagency networks."

An IDP is made up of two elements: an Authority and Format Identifier, which defines the international addressing authority that assigned the network number, and an Initial Domain Identifier, which is the actual network number.

The DSP has three elements; the Loc-area, which defines which subdomain the node is in; the node identifier, which provides the node's unique address; and the Sel, which identifies the transport-layer software that other nodes must use to receive data sent by it.

As part of its plan to ease migration to DECnet Phase V, DEC will include a default IDP with every DECnet Phase V license. This will enable users to install DECnet Phase V software on nodes in DECnet Phase IV networks.

"Users don't have to wrestle with these new OSI concepts just to keep doing what they were doing," Kelly said. ◼

Primary Access adds to system

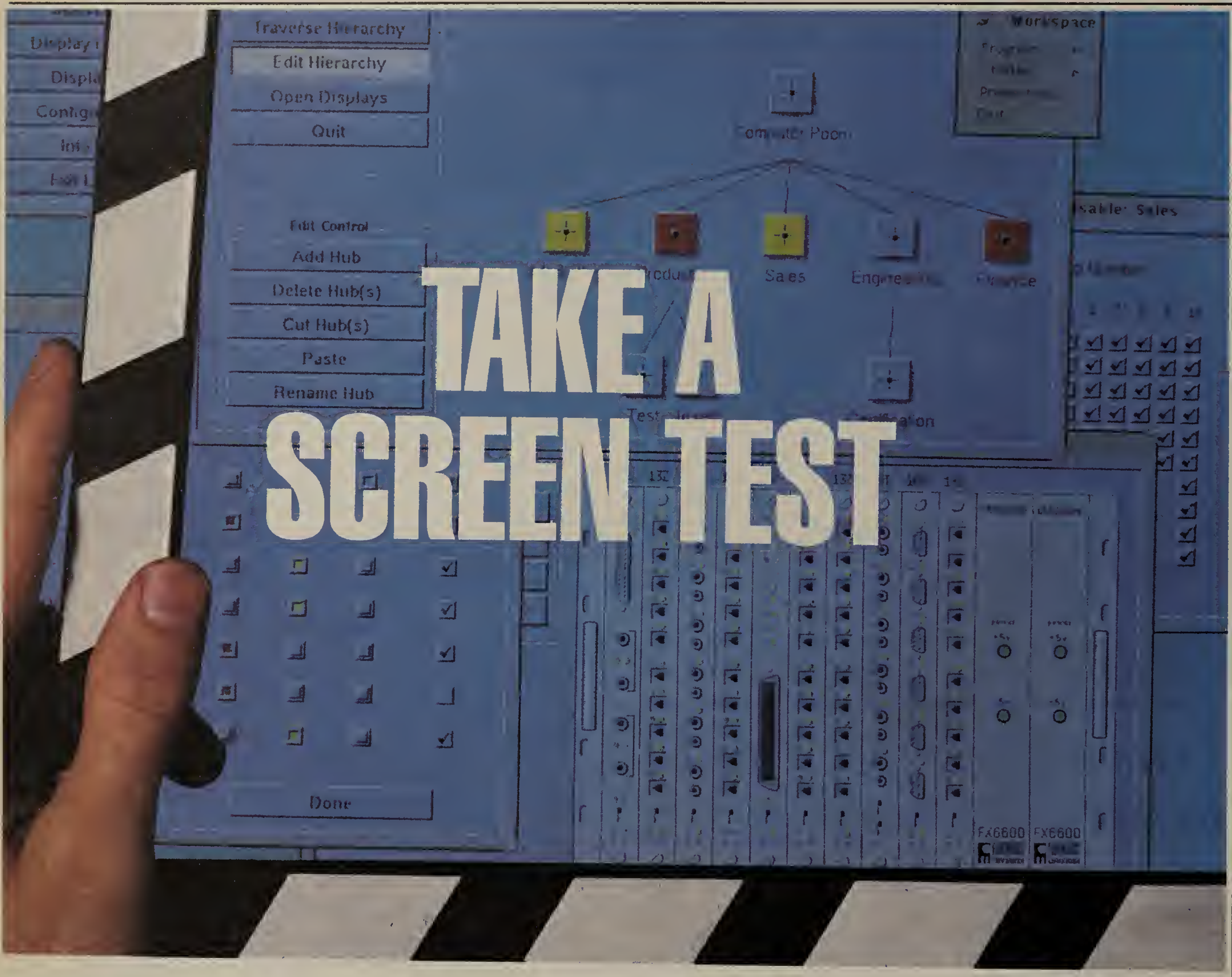
continued from page 17

The Primary Access system accepts a full T-1 from the long-distance carrier. Its channel bank breaks that into 24 DS0s and routes them over an internal bus to the Digital Signal Processor (DSP) cards, which perform the modem function.

The DSPs demodulate the signals, which are still in the carrier's digital pulse code modulation format, and convert them into the digital format used by the RS-232 interface. The signals are then routed over the bus to the DCP cards. The DCPs packetize the signals and perform some multiplexing in order to send the signals out over a single V.35.

The V.35 interface can then be used as the connection to a front-end processor, a public data network or a T-1 multiplexer. Multiple 16-port DCPs can be configured to send data to the same V.35 port, Berlin said.

The X.25 DCP cards are expected to be available in April. Each card, outfitted with the required software, costs $5,000. ◼



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Worth Noting

> "Not many people will implement pure OSI [for internetworking]. Those that need interoperability now will use TCP/IP. Those that can wait will wait for DEC and IBM to come out with their OSI solutions."
>
> **Tom Wood**
> Industry analyst
> Business Research Group
> Newton, Mass.

Netnotes

NCR Corp. has boosted the NetWare server support for its Unix-based System 3000 computers with the introduction of NetWare/X software.

NetWare/X is NCR's latest implementation of Novell's Portable NetWare for systems running Unix System V.4.

The software allows NCR System 3000 computers to serve networks of DOS, OS/2 and Apple Computer, Inc. Macintosh clients. NetWare/X also provides Systems Network Architecture and Network File System support.

NCR's NetWare/X pricing begins at $10,000.

Sun Microsystems, Inc. and **Interphase Corp.** have signed a joint marketing agreement under which Sun has agreed to market the Interphase NC400 Network Co-Processor.

The NC400 is an Ethernet controller that processes Network File System (NFS) traffic. The processor board fits in the backplane of a Sun SPARC-Server system.

By off-loading NFS processing from the Sun servers, the NC400 boosts network performance and allows the servers to support larger networks.

The NC400, which is now available from both Interphase and Sun, is priced at $7,950. ▣

Two vendors release SQL applications for Windows

Support links to multiple relational DBMS servers.

By Eric Smalley
Senior Editor

SAN JOSE, Calif. — Two software vendors will unveil at the Windows and OS/2 Conference here this week Microsoft Corp.'s Windows 3.0-based applications that offer SQL links to relational data base servers.

Precision Software of Irving, Texas, will introduce an upgrade to its Superbase 4 relational data base for Windows 3.0 that will include a revamped networking scheme and embedded SQL.

The embedded SQL in Version 1.3 includes facilities for importing and exporting data between SQL and Superbase tables, according to company officials.

The company will also unveil the Superbase SQL Library that, in conjunction with the embedded SQL, will allow Superbase to connect to other relational data bases on remote servers.

The Superbase SQL Library is a set of Windows Dynamic Link Libraries linking Superbase to specific data bases.

Dynamic Link Libraries allow Windows applications to make calls to other applications. The Superbase SQL Library allows concurrent links to multiple data bases, according to company officials.

The initial release of the Superbase SQL Library will support links to Microsoft SQL Server on OS/2; Sybase, Inc. on Unix systems and Digital Equipment Corp.'s VMS; and GUPTA Technologies, Inc.'s GUPTA SQLBase on DOS, OS/2 and as a Novell, Inc. NetWare Loadable Module (NLM).

Support for Oracle Corp.'s Oracle on OS/2 and XDB Systems, Inc.'s XDB on DOS, OS/2 and as a Novell NLM are expected to be available soon after the product begins shipping, according to John Tranmer, Precision Software's chairman. Support for Oracle on other platforms and IBM's Database Manager for OS/2 Extended Edition, DB2 on MVS, SQL/DS on VM and SQL400

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Telnet, LAT gateway links Ethernet, token-ring nets

By Eric Smalley
Senior Editor

MADISON, Wis. — Persoft, Inc. has introduced a token-ring-to-Ethernet gateway that supports Telnet and Digital Equipment Corp.'s Local Area Transport (LAT) terminal-to-host protocols and acts as a Novell, Inc. NetWare Internetwork Packet Exchange (IPX) router.

Persoft also introduced a wireless Ethernet bridge that company officials said is the first Ethernet bridge to use spread-spectrum radio technology.

The gateway product, called Passage, consists of a token-ring adapter card, an Ethernet adapter card and Persoft software.

Passage, which resides in a dedicated IBM Personal Computer AT, allows personal computers on token-ring networks to access DEC VAX and Unix host systems on Ethernet networks using Persoft's SmarTerm terminal-emulation software. SmarTerm performs DEC VT emulation with LAT, Telnet and File Transfer Protocol support.

The software also routes IPX traffic, allowing token-ring workstations to access NetWare servers on both token-ring and Ethernet networks.

Passage appears to the Ethernet network as a spanning tree Ethernet bridge and to the token-ring network as a source routing token-ring bridge, according to Persoft officials.

Persoft's wireless Ethernet bridge, called Intersect Remote Bridge, uses spread-spectrum radio technology to link remote Ethernet networks that are as far as 800 feet apart, according to company officials.

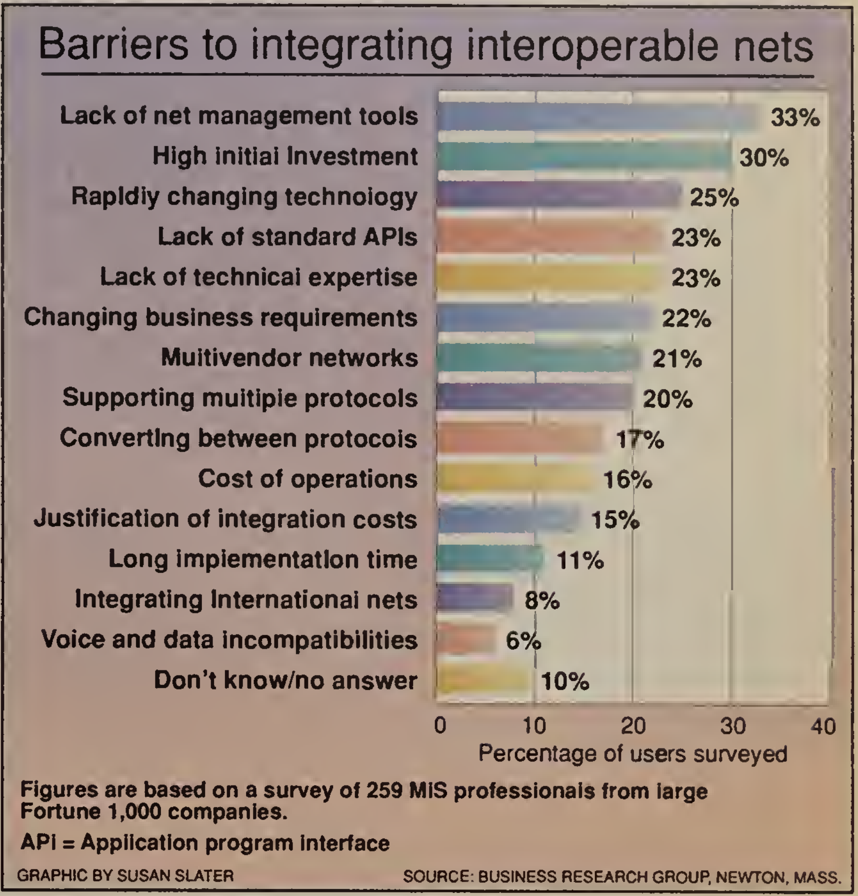
The bridge supports a data rate of 2M bit/sec and is compatible with the IEEE Ethernet standard, the officials said.

The product consists of a wireless Ethernet board, a standard Ethernet board and Persoft software.

The Intersect Remote Bridge, without the personal computer, costs $4,995.

Passage is scheduled to be available this spring. A 20-user license costs $5,995, and a 50-user license is priced at $9,995.

Persoft can be reached at UW Research Park, 465 Science Drive, Madison, Wis. 53711, or call (608) 273-6000. ▣



Barriers to integrating interoperable nets

Figures are based on a survey of 259 MIS professionals from large Fortune 1,000 companies.

API = Application program interface

GRAPHIC BY SUSAN SLATER

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

Users face obstacles to net integration

Study identifies roadblocks confronting users who want to bring LANs into their enterprisewide nets.

By Caryn Gillooly
Senior Editor

NEWTON, Mass. — Users are finding it increasingly important to bring their personal computer LANs into the enterprise network fold, but hefty obstacles loom ahead, according to a recent study.

Research by the Business Research Group (BRG), based here, found that 85% of the 259 MIS professionals responding to a recent survey said the integration of personal computer local-area networks into the enterprise is a critical move.

The study suggested, however, that the lack of network management tools, the high initial investment and rapidly changing technology may be slowing integration and causing more users to take a careful look at the implications associated with enterprisewide integration.

"Users are approaching [the task] with extreme caution," said Tom Wood, an industry analyst at BRG.

Kevin O'Neil, BRG's vice-president of network research and consulting, concurred. "These problems are inhibitive to the early implementor," he said. "People have plans to integrate [personal computer LANs] more closely into the enterprise, but their plans are sometimes more aggressive than the available tools and vendor support."

O'Neil added that users are realizing that if they adopt the technology too quickly and do not have the proper tools and support, they will be in a difficult position if problems arise.

The obstacles

In the study, users were asked to list the three largest impediments to integrating separate information systems into one network. Thirty-three percent listed a lack of network management tools as one of the main problems, 30% listed the high initial investment and 25% listed rapidly changing technology (see graphic, this page).

Systems management, according to Wood, was easier when users were only worried about self-contained networks. Novell, Inc., for example, offers fairly sophisticated management within NetWare; and few things can match the robustness of IBM's NetView network management system.

But Novell, Wood said, is not even on par with Banyan Systems, Inc.'s VINES enterprise management capabilities and, in general, IBM can only manage IBM.

"Before, users had to manage only the LAN or only the mainframe. Now they have to manage a network of mainframes and PC LANs, and the applications that users want to integrate on that network," Wood said.

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Two vendors release SQL applications

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on OS/400 is also planned.

The improved network features of Superbase 4 Version 1.3 include simultaneous queries and updates to the same Superbase files by different users, and optional automatic on-screen refresh of data that has been changed while a file is being accessed, Tranmer said. Both capabilities are achieved through the use of standard DOS file locks, he said.

Superbase 4 Version 1.3 and the Superbase SQL Library is expected be available next month. Superbase 4 costs $695, and upgrades cost $50. The library costs $495.

Separately, Powersoft Corp. of Burlington, Mass., will introduce a Windows-based application development environment that supports SQL and offers links to back-end data base servers.

The purpose of PowerBuilder

PowerBuilder is an object-oriented application development environment designed for creating client/server applications using a graphical interface under Windows. It will initially support Microsoft SQL Server, GUPTA SQLBase and Oracle as data base servers.

Application elements are represented as objects linked graphically on-screen to form programs. PowerBuilder includes a scripting language and shared-object libraries.

The software also includes an object called DataWindow, which allows data base information to be manipulated without SQL or scripts, according to company officials.

PowerBuilder supports Windows Dynamic Data Exchange for interacting with other Windows applications and Hypertext help, as well as the ability to call C-language functions in Windows Dynamic Link Libraries.

PowerBuilder is expected to be available in May at a cost of $2,995. Run-time license costs vary depending on the number of users. ◘

Users face obstacles to net integration

continued from page 19

The study showed that users are almost equally concerned with the cost of integration. Although users placed the most emphasis on initial cost, according to the study, 16% of the respondents listed the ongoing cost of operation as one of their top three integration problems while 15% listed cost-justification.

The problem starts with the initial investment, which includes network planning, design, purchasing and, ultimately, implementation. According to Wood, the cabling, bridges, routers, protocol analysis and network management products are only a small part of the picture.

After the products are put in place, he said, "there's still the cost of an expert manager to watch over the whole thing." And after that, there are the ongoing costs associated with the care of the network. "The life cycle costs can kill you," Wood said.

Rapidly changing technology — the third most frequently mentioned problem — is not a new complaint, but as networks grow in complexity and size, the problem gets worse.

"In internetworking products, for example, the [changing technology] problem is immense," Wood said. "People are buying routers when they need bridges; people are buying brouters and only using half of the functionality." Users are being overwhelmed by new technologies to the point where they don't understand which products provide the functionality they need.

"The problem of changing technology has always been around; things are always innovating," Wood said. "But at this point, we're finding that users are almost in a chaotic mode."

The solutions

There are not necessarily solutions for all these problems. Implementation costs, for example, will only decrease as more users build enterprisewide networks. "As far as the high [initial investment], there is no relief in sight," Wood said. "It will take time and tools. When demand increases, the price will come down."

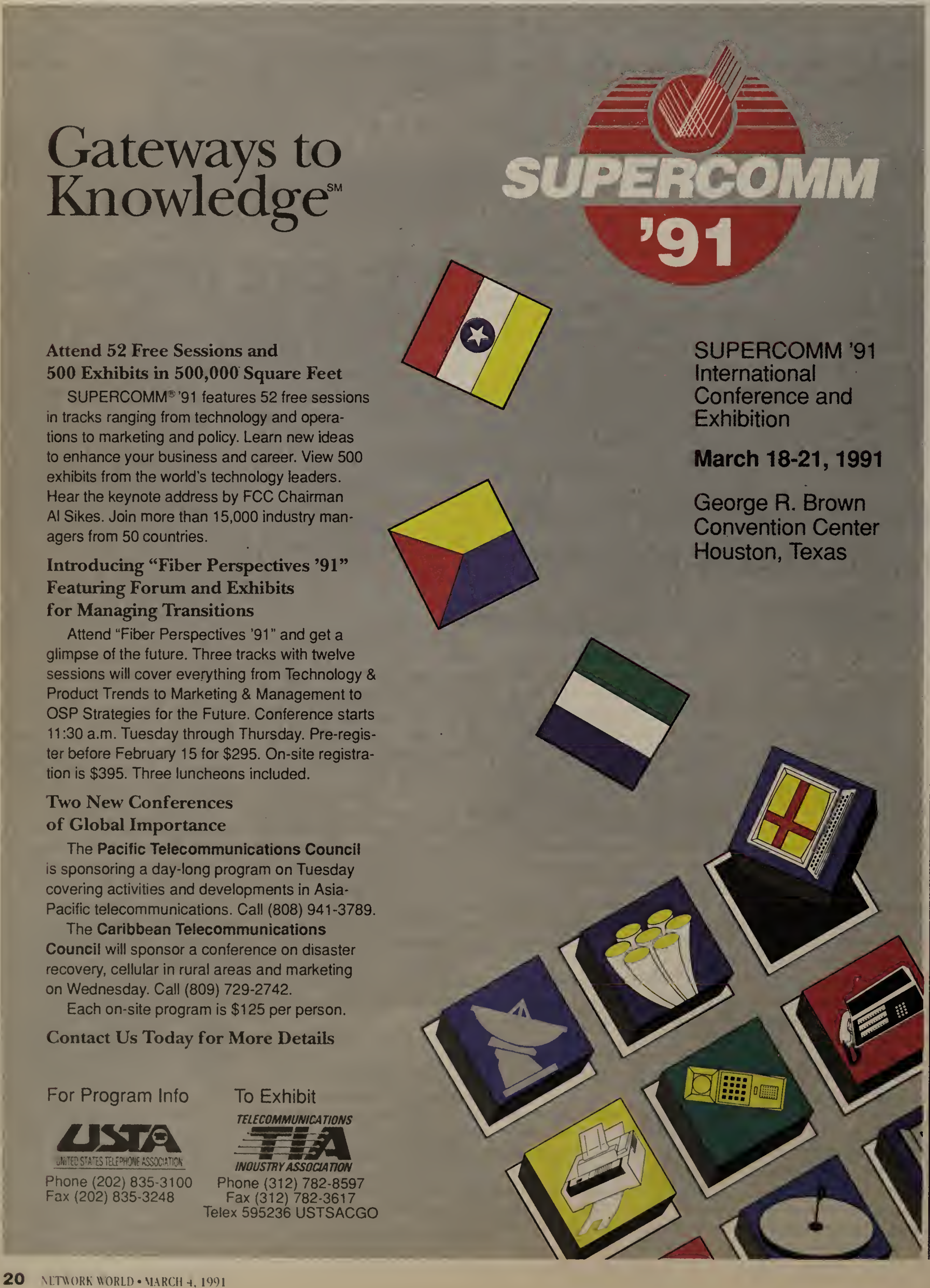
For the other problems, however, Wood suggested that users lean harder on their vendors to implement standards and work with other vendors to ensure interoperability among products.

The Simple Network Management Protocol (SNMP), for example, although only providing a low level of management, is a step in the right direction, Wood said. For those users that need multivendor management now, Wood advised that they keep an eye out for small companies offering new network management tools. "These smaller companies are the innovators and will take advantage of the [holes left by] larger vendors," he said.

Standards such as SNMP will also help users feel confident that even if technology changes, it will adhere to the same basic specifications. Wood pointed out, however, that this is where vendors are guilty of not moving fast enough.

"Vendors won't implement standards if they don't have to," Wood said. "Vendors win when they differentiate themselves."

To help with this problem, Wood advised that users talk to their vendors about their strategic directions and what standards they plan to support. "Try to find out what's real and what's vapor," he said. ◘



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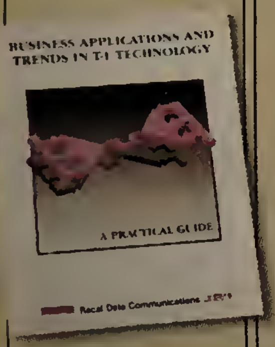
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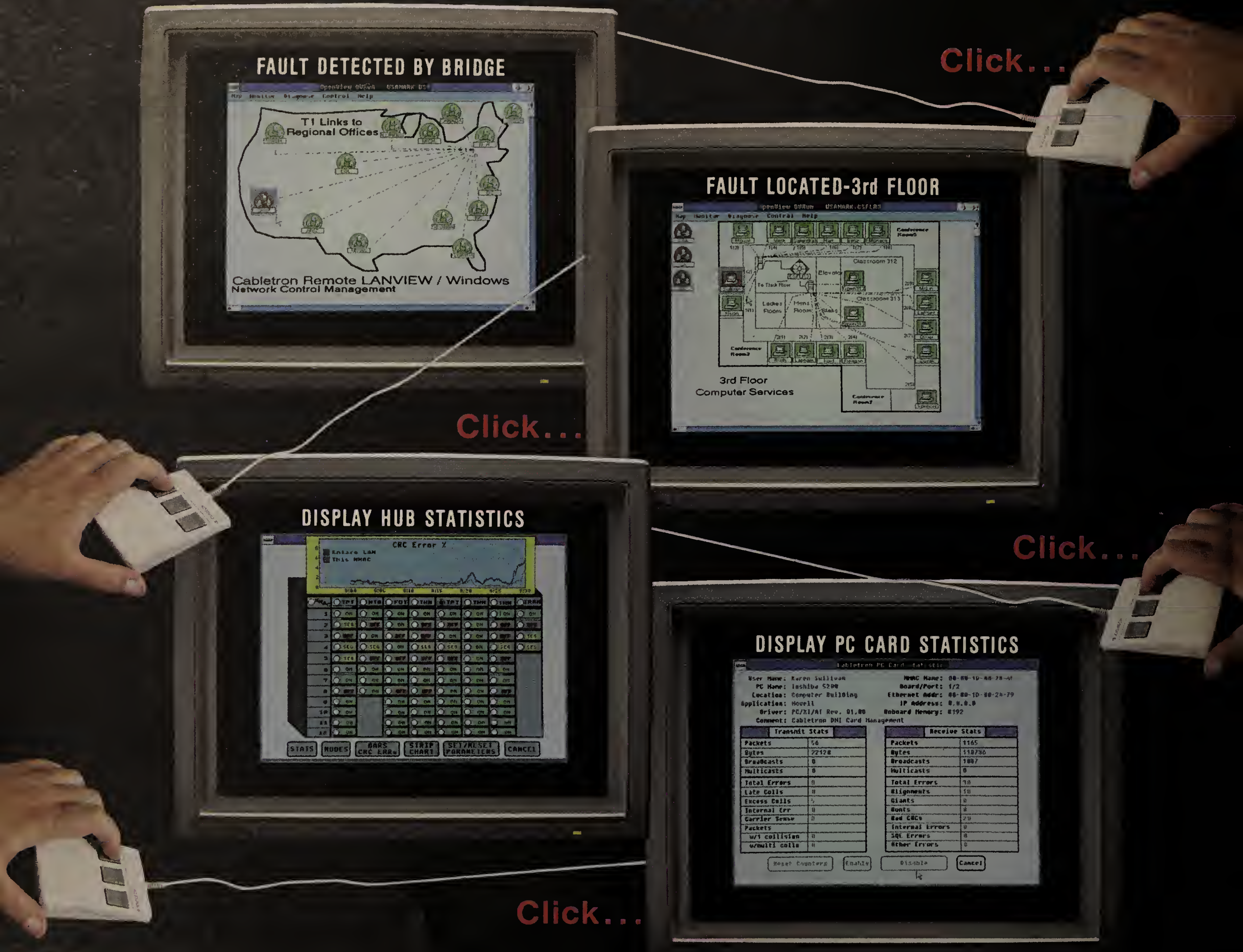

User Name: Karen Sullivan
PC Name: Toshiba 5200
Location: Computer Building
Application: Novell
Driver: PC/XI/AT Rev. 01.00
Comment: Cabletron DNI Card Management
MMAC Name: 00-00-1D-00-28-4
Board/Port: 1/2
Ethernet Addr: 00-00-1D-00-24-79
IP Address: 0.0.0.0
Onboard Memory: 8192

Transmit Stats	
Packets	56
Bytes	22128
Broadcasts	0
Multicasts	0
Total Errors	0
Late Colls	0
Excess Colls	[illegible]
Internal Err	0
Carrier Sense	0
Packets	
w/1 collision	0
w/multi colls	0

Receive Stats	
Packets	1165
Bytes	118736
Broadcasts	1007
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Worth Noting

"The ability to explain how a technology will meet business requirements is a scarce skill among [information system] professionals. It's almost an art."

Laurie Bride
Manager of network architecture
Boeing Computer Services Co.
Seattle

Association Watch

The **North American MAP/TOP Users Group (NAMTUG)** will hold its Spring Conference from May 7 to 9 at the Stouffer Nashville Hotel.

The "MAP/TOP: OSI at Work" meeting will include a tour of General Motor Corp.'s nearby Saturn Plant.

The conference costs $350 for Corporation for Open Systems International and NAMTUG members and for government employees. The cost for other attendees is $425. For more information, call Steve Sickels at (703) 883-2704.

Following the introduction of a uniform electronic data interchange format for use by the U.S. automobile industry, the **Bankers Electronic Data Interchange Council** recently published a guide titled "Electronic Dealer Drafting Banking Convention" to help banks and other financial institutions use the new format to conduct EDI within the auto industry. Sponsored by the National Automated Clearing House Association (NACHA), the council is designed to help financial institutions meet the needs of their corporate customers.

The booklet discusses the benefits, specifications and a recommended implementation approach. The cost is $15 for members and $25 for nonmembers. To obtain a copy, send a prepaid order to Publications Department, NACHA, P.O. Box 64193, Baltimore, Md. 21264.

NW User Panel discusses pros, cons of outsourcing

Stress caution in making net outsourcing decision.

By Maureen Molloy
Staff Writer

Members of *Network World's* User Advisory Panel are divided on the benefits and risks of outsourcing network operations, but they agree that users must move cautiously in making an outsourcing decision.

Most members of the panel said they would consider handing over some basic network operations to a third party but would be leery about relinquishing strategic business applications. They also expressed concern about losing control through outsourcing.

"The most dangerous thing about outsourcing is the potential loss of control," said Stan Welland, manager of corporate telecommunications at General Electric Co. "Whether you outsource a small portion of your network or the entire thing, it's imperative the user maintain control over the arrangement."

The User Advisory Panel comprises representatives of leading user groups as well as top network executives from companies in a range of industries.

Lionel Gillerman, director of telecommunications services at McDonnell Douglas Aerospace Information Services Co., agreed with Welland.

"Outsourcing, by definition, requires a company to give up some control of the day-to-day net operations. But the user must always remain in the driver's seat. Otherwise, it just won't work," he said.

The panel agreed that outsourcing involves the transfer of network assets or staff to a vendor, who then assumes profit and loss responsibility for some or all of the user's data processing and network operations. The user simply pays for the service on an ongoing basis.

Almost all the panelists said they would outsource so-called commodity operations, such as data center operations, basic network transport and personal computer support.

"It's almost impossible to manage everything in-house today, so the best candidates for outsourcing are those applications that don't support competitive strategies," said Michael Kaminski, manager of CIM/Networking Technologies at General Motors Corp. He stressed, howev-

(continued on page 26)

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Frame relay notes. A number of vendors have come out with booklets about frame relay that do a good job of explaining the significance of the technology and how it works.

Netrix Corp. has issued "The Buyer's Guide to Frame Relay Networking," a 70-page booklet geared toward network planners considering implementing frame relay technology.

Written by three Netrix employees, the guide describes in easy-to-read language how frame relay works. It also uses colorful drawings to illustrate items such as packet-framing structures and network configurations. In addition, the guide provides a glossary of terms and a checklist for evaluating frame relay networks.

Netrix has also issued booklets describing other network issues, such as wide-area networking.

US Sprint Communications Co. recently published "The Frame Relay Solution," a 38-page booklet that is part of the carrier's "TeleNotes" series of monographs on network technologies. The piece effectively discusses the implications of frame relay for corporate nets. It also describes in some detail how the technology stacks up against other technologies, such as Integrated Services Digital Network, T-1 and X.25.

To order the Netrix booklet, call Netrix at (703) 742-6000. To obtain the US Sprint booklet, write to the "TeleNotes" editor, International Affairs Department, Sprint International, 12490 Sunrise Valley Drive, Reston, Va. 22096.

"Information systems take longer to develop than anything else. That limits how fast the company can pursue new opportunities. This is significant because the nature of SeaLand's business is changing from shipping to logistics and information management."

John Parker
Senior vice-president
Computing/network strategy
Sea-Land Services, Inc.

Sea-Land exec talks about IS challenges

Discusses global networking strategies, new directions and dealing with upper management.

Sea-Land Services, Inc., a leading U.S. shipping company, believes that to succeed it must rapidly move information, as well as cargo, around the globe.

The company has already built an impressive worldwide network that spans more than 200 locations in 70 countries. To make sure it keeps the competition in its wake, Sea-Land plans to invest more than $350 million in information technology during the next five years.

The man responsible for charting Sea-Land's computing and network strategy is Senior Vice-President John Parker. *Network World* Senior Editor Wayne Eckerson recently spoke with Parker about the challenges of building and managing a global network and the challenges he faces in his additional position as chief information officer (CIO).

How important is the network to your business?

If it doesn't work, we don't work. While we don't have the most sophisticated network, it is far-reaching. We use any form of communications we can get, from T-1 to radio broadcasting. In some parts of the world, it's a struggle just to get 50 baud telex. We don't use smoke signals yet, but we would if we had to.

What is most challenging about meeting the information technology needs of a world-class shipper?

Our biggest challenge is to understand where the business is headed as early as possible so we can design systems to support new strategic initiatives.

Information systems [IS] take longer to develop than anything else in the company. It takes about two years to build a world-class vessel from scratch. We'd be hard-pressed to develop and implement a major new system and train people to use it in that period of time. That limits how fast the company can pursue new opportunities. This is significant because the nature of Sea-Land's business is changing from shipping to logistics and information management.

What are you doing to speed the development of new systems?

We are using every trick we know. We use commercial packages, modify existing systems, employ [computer-aided software engineering] tools, use systems integrators — whatever it takes to get the work out the door. Then the challenge becomes making sure the systems remain integrated. That's where a blueprint or systems architecture becomes important.

What's the key to developing a systems architecture?

You find a sector in the company that is in some pain because there isn't an architecture. In those areas, management will be more willing to critically examine their systems and invest the time and money in doing architectural studies. Then, you have to have sufficient executive excitement about the project to make it work. My rule of thumb is that unless the senior executive of the unit

(continued on page 26)

There are still some t

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Panel discusses pros, cons of outsourcing

continued from page 23

er, that strategic applications are best managed in-house.

Roy Bruce, senior adviser at the International Communications Association, agreed. He said a company that perceives network operations as a competitive tool should not outsource those functions.

"When you view your net as bringing strategic advantages, you don't want to risk losing creative applications to your competition," he said. "Outsourcing leaves you more open to that risk."

Chuck Papageorgiou, network administrator at United Parcel Service, said he feels no reluctance in letting vendors manage nets that support strategic applications. His company has outsourced both commodity and strategic functions.

"Of course, you don't put an outsourcing deal together haphazardly, and you carefully weigh the vendors' stability, financial viability and innovation," he said. "But creative secrets can be protected through legal contracts with the vendor."

He added that any contract should provide an escape clause that will allow the user to switch to another provider if the vendor fails to meet expectations. But others said this may be difficult to do once a company has sold its assets and staff to a third party.

(continued on page 52)

Sea-Land exec talks about IS challenges

continued from page 23

chairs the project steering committee, it won't work. It's also important to define the scope of the architectural study so it gets done in six months. Otherwise, management will lose interest.

How do you ensure that you are linking technology to the company's business needs?

I sit on the Senior Management Council, which is composed of the chairman of the board and senior management. That's where most of the major business plans are discussed.

Second, we work closely with user advisory groups in each of the business units to develop a system plan that is responsive to where the business units want to go. Our discussions with the advisory councils forms the basis of our three-year IS plan.

In addition, we have information account managers who are assigned to each business unit. They spend time talking to end users and observing business unit operations. They evaluate the effectiveness of existing systems and determine how systems could be used to improve operations.

Finally, we have functional advisory councils composed of senior managers from multiple business units who decide how various functions, such as finance, marketing and purchasing, will work.

In essence, we are an internal business that has to meet the needs of its customers — the employees of Sea-Land. The advisory councils and account managers help us stay in touch with the business, as well as user needs and desires.

IS managers at some companies are having a difficult time persuading management to invest in strategic systems projects given the current economic climate and cost pressures. How about Sea-Land?

Our management is very enlightened when it comes to IS spending. Last year, management gave us more money and resources than we asked for in our budget. Our management understands that Sea-Land's success hinges upon the degree to which we can manage information flows around the world.

It has been said that CIO stands for "Career Is Over." Why do many CIOs have a difficult time holding on to their jobs?

Managing expectations is a big part of being a CIO, and it's more difficult to do that now than ever. Most executives don't understand the complexity of multivendor systems integration projects, nor should they. So it's important to communicate exactly what you can and cannot do in a given time frame at a given cost.

You've got to make sure that both sides know what they are committing to, especially if the project involves reworking a companywide integrated system.

How do you evaluate the effectiveness of technologies you have implemented?

We have a systems review team that goes into Sea-Land sites and evaluates how effectively they're using information systems. They look at the system use, organizational structures, training programs, etc. The team then prescribes courses of action the site manager can take to improve the payback from existing systems.

What distinguishes Sea-Land's use of information technology from its competitors'?

We have had a more sustained investment in information technology than the competition has. As a result, we have developed a host of integrated systems that allow us, for example, to track movements of [cargo] containers and forecast ship carrying capacities. The ability to track cargo is becoming extremely critical because companies are starting to see shipments as inventory in transit. By closely monitoring shipments, they can reduce inventory and practice just-in-time delivery. ◻

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USER STRATEGIES, INTERNATIONAL SERVICES & REGULATION

World News

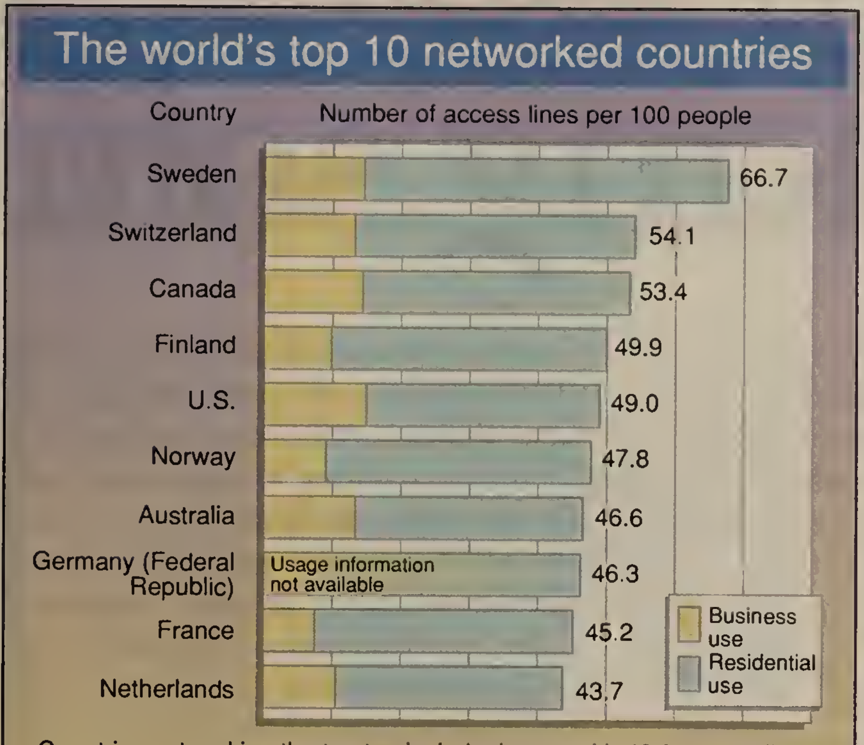
The New York-based international carrier, **World Communications, Inc.**, last week said it has reached an operating agreement with **Mercury Communications, Ltd.**, the London-based carrier, to provide international switched service between the U.S. and the U.K.

The agreement, which was scheduled to take effect March 1, will enable World Communications to use its own facilities to carry switched traffic to the U.K. Previously, World Communications had to resell switched service from other carriers in order to send switched traffic to the U.K.

George Frylinck, senior vice-president for marketing and sales at World Communications, said that by using its own facilities, the carrier will improve call setup times for switched service to the U.K. He added that the agreement will reduce World Communications' service provisioning costs, making the carrier more profitable.

World Communications also has operating agreements to supply switched services to the Dominican Republic, Hungary and Venezuela. The carrier has forged these agreements over the past six months.

Previously, World Communications only offered international private-line services. World Communications is entering the international switched services market in part because of financial backing from its parent company, the Swiss conglomerate Tele-Columbus, AG. ▣



Countries not making the top ten include Japan, with 42.2 access lines per 100 people, and the U.K., with 41.4 access lines per 100 people.

SOURCE: "THE WORLD'S TELEPHONES; A STATISTICAL COMPILATION AS OF JANUARY 1989," AT&T, BASKING RIDGE, N.J.
GRAPHIC BY SUSAN J. CHAMPENEY

European Commission puts videoconferencing to use

Improves links among EC member countries.

By Maureen Molloy
Staff Writer

BRUSSELS, Belgium — The European Commission has installed a videoconferencing facility at its headquarters here to improve communications with its 12 member countries.

The videoconferencing system will enable the commission to establish on-demand connections with officials in member nations, allowing the exchange of information, as well as preliminary discussions for decisive meetings. Decisions can be improved because information is exchanged faster and more people participate in meetings.

"Documents can be presented, queries raised, diagrams explained and papers exchanged. And, most important, the reaction of the others can be gauged," said Norbert Hahn, a spokesman for the commission.

The new videoconferencing studio can be used by as many as three participants at once. A Philips Communications 2M bit/sec video coder/decoder (codec) will ease communications from Brussels to about 2,000 videoconferencing studios worldwide.

The videoconferencing system will also protect sensitive or classified information against interception by using encryption.

The transmission of text and graphics at 2M bit/sec allows a clear representation of the documents on high-definition 60-Hz monitors. The new videoconferencing equipment is expected to be connected to the worldwide network by this fall. ▣

New mobile satellite phones shine in war

Systems keep journalists, others in touch during Gulf conflict; success may boost commercial use.

By Barton Crockett
Senior Editor

GAITHERSBURG, Md. — The war to liberate Kuwait is giving a big boost to a new international networking technology — portable satellite-based telephones.

The Persian Gulf conflict has stimulated one of the largest portable satellite telephone deployments to date and could spur commercial demand for the technology by illustrating how easily and quickly the phones can establish international network links.

News organizations such as the Associated Press, Cable News Network (CNN), CBS News, Knight-Ridder, Inc. and *The Wall Street Journal* are using dozens of these systems to transmit stories from areas where traditional telephone service either has been knocked out or has never existed. The systems typically consist of a collapsible antenna and telephone set that can be folded into a briefcase weighing as little as 65 pounds.

"We were live out of Kuwait at 2 a.m. [the day after the allies launched the land invasion] using two of these systems," said Frank Governale, director of bureau operations for CBS News.

Governale said CBS News has purchased and leased a total of six new portable satellite telephones since the crisis began, in addition to the two it already had.

Mobile Telesystems, Inc., which manufactured about 80% of the more than 2,000 portable satellite telephones now deployed in the world, has seen orders increase about 50% since the Iraqi invasion of Kuwait, according to Rania Habbaba, the company's marketing manager.

Jon Klein, vice-president at IDB Aero-Nautical Communications, Inc., based here, which supplies transmission services for portable satellite telephones, said the Gulf War represents one of the largest deployments ever of mobile satellite telephone systems.

He added that the crisis could give a big boost to the mobile satellite phone industry by illustrating how easy the systems are to use.

Testimonial to success

The ability of reporters such as CNN's Peter Arnett to easily use portable satellite telephones, called satcoms, to file stories will encourage more people to purchase them, Klein said.

He added that the satcom business will grow even more after the International Maritime Satellite Organization (INMARSAT) launches a new satellite telephone service in 1992, dubbed INMARSAT-M.

INMARSAT-M will use powerful new satellites that will enable earth station makers to further reduce the size of mobile satcom units. This will make mobile satellite telephones even easier to use, which will help the entire industry, Klein said.

INMARSAT satellites support the bulk of the world's mobile satellite telephone service. Typically, satcom signals are beamed from mobile earth stations to INMARSAT satellites. The satellites then bounce the signals down to fixed earth stations, which relay transmissions into the public network. ▣

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—Larry Uline,
Manager, Technical Support
World Communications, Inc.

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At the heart of IBM networking are the members of the Personal System/2® family that act as high-performance LAN servers. The PS/2® Model 95 XP 486, IBM's sophisticated new 486™ computer, was especially designed to optimize network performance. The Model 95 features an Intel 33 MHz 486 processor or a 25 MHz 486 processor that's easily upgraded to 33 MHz, which quickens the pace of your LAN's operations. For your network's storage, not only are the Model 95's SCSI hard files lightning-quick, but the overall capacity is truly impressive—up to 1.6 gigabytes internally, and up to 8.96GB or more with IBM PS/2 External Enclosures. IBM also offers highly efficient, lower-cost server alternatives with the PS/2 Models 80 386 and 65 SX. All of IBM's PS/2 LAN servers feature the Micro Channel™ architecture, with its 32-bit data path and bus-mastering capabilities. The Micro Channel busmaster adapters allow you to expand your network's capabilities by adding multiple processors—like adding "computers" to your computer. It all amounts to highly reliable and powerful managers that inspire the same kind of performance from the rest of your network.

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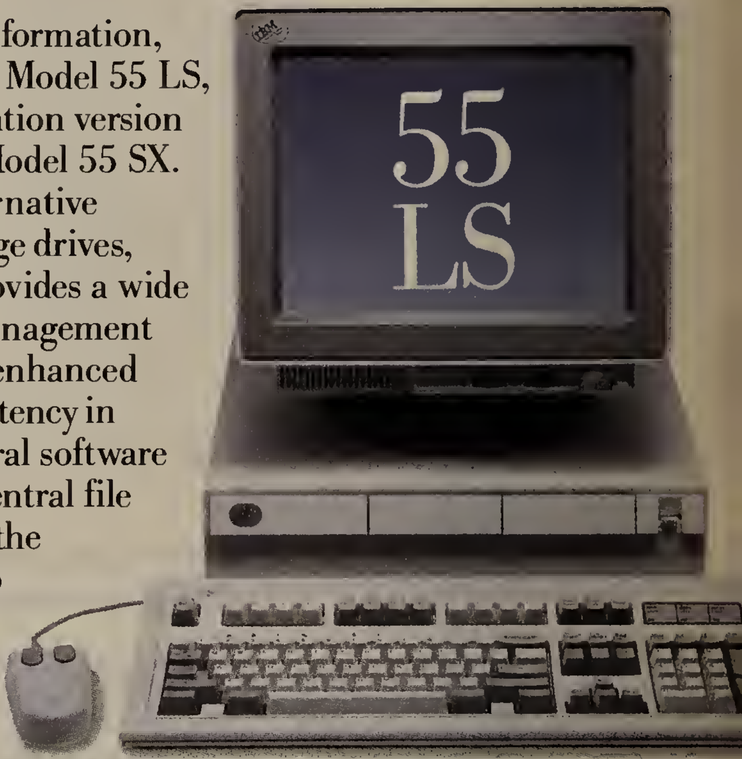
Whatever your needs may be, IBM has PS/2s that can serve as excellent client stations. And if you want to keep a tight rein on your network's information, IBM offers the PS/2 Model 55 LS, a medialess LAN station version of the best-selling Model 55 SX. A cost-efficient alternative to models with storage drives, the Model 55 LS provides a wide array of effective management controls, including enhanced data security, consistency in software levels, central software maintenance and central file backup. Not only is the Model 55 LS easy to hook up (it comes standard with a Token-Ring Network or Ethernet adapter), but should you need to modify your system, it's easy to upgrade with diskette and file storage devices.



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to advanced IBM leads the way.

performance, less memory requirements, fewer DASD requirements and support for Adobe Type Manager™ fonts. And with support for 128 DOS requesters, LAN Server V. 1.3 can provide significant cost benefits for DOS network users. Compatibilities between IBM DOS LAN requester and the current version of Windows® 3.0 (LAN Manager 2.0 enhanced) have also been added, capping off the many ways IBM gives you greater flexibility in the LAN environment.

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For a great finish to any project, IBM offers a full range of printers for client stations, as well as the speedy, large-capacity IBM LaserPrinter, an efficient printing station with immensely attractive LAN benefits. With a high-duty cycle and fewer parts for fewer breakdowns, it offers extremely reliable printing while still boasting a 10-ppm printing speed. The optional paper bins allow for more efficient collation, so there's no need to visit and rearrange the printing station prior to the particular job. You can also easily and inexpensively upgrade to Adobe PostScript.® It all adds up to a range of complete, reliable printing solutions that can handle the kind of workload that any network, large or small, can generate.

Step Up The Pace With Token-Ring Network.

To optimize the link between your LAN server and client stations, you need a hardware connection that gives you access to departmental and company data, as well as communication with your co-workers—in other words, you need access to a winner's circle: the IBM Token-Ring Network, the winner four years running of the *PC World Magazine* World Class Award. It's a reliable and flexible networking solution, one of the only connections with a data transfer rate of up to 16MB per second. You can also diagnose, isolate and correct problems in one section of your LAN without affecting the rest of your network. A system you can build on, IBM Token-Ring Network provides a reliable connection that's as strong as your need to keep in constant touch with the people and information around you.

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Of course, IBM provides you with several ways not only to connect your PS/2 LAN to a multitude of mid-range and mainframe systems, but also to communicate with non-IBM systems as well. To conduct transactions such as hotel reservations, car rental and credit card authorization, an IBM communications adapter such as the IBM ARTIC Portmaster Adapter/A busmaster card, with the proper communciations software, can link your PS/2 with other companies' computers. With an Ethernet adapter, you can also connect to most Ethernet LANs. The integrated communications options of IBM OS/2 Extended Edition software can also allow your PS/2 to send mail, transfer files and access applications on other systems concurrently. So it's easy to benefit from the strengths of an IBM network while still having access to the rest of the computing world.

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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Compaq outfits superserver with subsystem

Compaq Computer Corp. recently introduced the **Compaq Intelligent Array Expansion System** for the Compaq SystemPro, a so-called superserver.

The device has a 32-bit Intelligent Drive Array Expansion Controller and comes standard with 2.6G bytes of fixed disk drive array storage, scalable up to 9.1G bytes. According to Compaq, the expansion unit will be most beneficial to users with storage-intensive applications.

Compaq also announced a digital audio tape (DAT) drive option for its high-end Compaq SystemPro and Compaq DeskPro computers.

The Compaq Intelligent Array Expansion System Model 2600, available this quarter, costs $21,999. The DAT drive option is available now and costs $5,499.

Compaq Computer Corp., P.O. Box 692000, Houston, Texas 77269; (713) 370-0670.

Centel serves up security for NetWare

Centel Federal Systems, Inc. recently announced two NetWare Loadable Modules (NLM) for Novell, Inc. local-area networks that provide server-based security and full support for Microsoft Corp. Microsoft Windows 3.0.

Net/Assure NLM and **Net/Assure 3.5** combine software features on a single board for NetWare 3.X servers and workstations.

Net/Assure NLM runs on NetWare 3.X servers and provides access control to workstations and servers, Data Encryption Standard encryption across the network and virus protection features, as well as audit trails collected at each local workstation and loaded onto the server automatically.

Net/Assure 3.5 runs on LAN workstations. It provides server access and logs audit trails of workstation activity.

Both products are scheduled to ship this month.

Centel Federal Systems, Inc., 11400 Commerce Park Drive, Reston, Va. 22091; (703) 758-7000.

Xylogics adds to low-cost server line

BURLINGTON, Mass. — Xylogics, Inc. last week announced a low-cost Unix terminal server that supports Ethernet links to Unix hosts and Digital Equipment Corp. VAX/VMS minicomputers.

Annex Three, supporting from eight to 64 serial ports for just over $100 per port, provides advanced security features and supports the Simple Network Management Protocol (SNMP).

The product follows the Annex One, which is no longer in production, and will eventually supersede the Annex Two, a terminal server that provides access to Unix environments.

Jack O'Neil, director of marketing for communications products at Xylogics, said the Annex Three provides better price/performance than the Annex Two as well as a range of new capabilities, including support for the DEC Local Area Transport (LAT) terminal protocol.

Like the Annex Two, the new server was designed to tie terminals, modems, printers and personal computers to Unix-based host computers over Transmission Control Protocol/Internet Protocol-based Ethernet local-area networks.

With this model, however, the company has added support for LAT, meaning customers will be able to toggle between sessions supported by Unix- or VMS-based computers.

The same capability will be made available to Annex Two users through a software upgrade.

The roughly $100 per port cost of the Annex Three was achieved, in part, by using a motherboard/daughterboard architecture instead of the more typical backplane design.

The Annex Three motherboard accepts two I/0 daughterboards, which are available from Xylogics in eight-, 16- and 32-port configurations. This architecture provides the benefits of modularity without the cost of manufacturing individual eight-port boards for an eight-slot backplane, O'Neil said.

The architecture has also been optimized for performance. Multiple 32-bit processors are used, which enables each of the 64 possible ports on an Annex Three to run at 38.4K bit/sec. The unit is also equipped with a parallel port for connection to printers.

The Annex Three was originally designed as a Unix server and comes with a Unix-based user interface that will be familiar to Unix devotees.

The Unix heritage of the product is also evident in the security provided by the product. Besides some of the more typical security capabilities supported, such as data encryption and the ability to restrict access to specific hosts, O'Neil said the Annex Three supports user-level passwords and audit trails so administrators can tell who logged onto what and when.

In terms of network management, the Annex Three supports the features and software of the earlier Annex models as well as an SNMP agent, meaning the device can be managed by SNMP management stations.

The Annex Three is available now and ranges in price from $3,995 for an eight-port device to $6,995 for a 64-port Annex.

Contact Xylogics at 53 Third Ave., Burlington, Mass. 01803, or call (617) 272-8140.

Multiprotocol controller ties hosts to X.25 links

LAGUNA HILLS, Calif. — Network Software Associates, Inc. recently unveiled the AdaptX25 Controller, which lets remote workstation users access multiprotocol IBM mainframe applications over X.25 packet-switched links.

Essentially, the AdaptX25 is software that runs on an IBM Personal Computer AT or Personal System/2 outfitted with a Synchronous Data Link Control or Token-Ring board for an upstream link to a host. It also has A Real-time Interface Coprocessor (ARTIC) coprocessor board from IBM for the downstream link to the X.25 network.

The software, the X.25 Control Program (XCP), supports 3270, LU 6.2/Advanced Program-to-Program Communications, remote job entry and LU 0 protocols, enabling remote users to dial into any host application supporting the same. AdaptX25 appears to IBM hosts as an 3X74 cluster controller, meaning the mainframes can support X.25 packet-switched links without using IBM's front-end processor-based NCP Packet-Switching Interface.

The XCP software is available now and costs $2,995.

Legent plans LAN version of NetSpy

Firm launches Version 4.0 of net performance mgmt. software, lays groundwork for LANSpy.

By Charles Bruno
Assistant Managing Editor

PITTSBURGH — Legent Corp. last week announced Version 4.0 of its NetSpy network performance management software and revealed plans for a LAN version to provide enterprisewide performance management.

NetSpy Version 4.0 provides users with a direct interface to IBM's NetView and Systems Center, Inc.'s NetMaster network management software. It also lays the foundation for the company to offer by year end a LANSpy option to provide central site performance management of distributed local-area networks.

NetSpy is a VTAM application that monitors network and host response times, as well as traffic and Network Control Program and VTAM statistics.

"What customers have been asking us for is if they can get a NetSpy for their LANs," said Greg Strouse, vice-president of Legent's Software Productivity Division. "We're saying now that the product is real, it's in beta test, and it won't be long in coming."

In fact, according to Don Imhoff, NetSpy product manager, Version 4.0 of the software will provide many of the features needed to access performance management data piped up to it from LANSpy running on downstream LANs.

> "We're saying that the product is real, and it won't be long in coming."
>
> ▲▲▲

"Version 4.0 is setting the foundation for enterprisewide performance management," Imhoff said.

Version 4.0 is the fifth major revision of NetSpy since it was released in April 1987, he said. Legent officials claim it is the first network performance manager to provide a direct link to net management products. NetSpy-generated alerts are shared with NetView or NetMaster via a program-to-program interface.

Perhaps an even more important enhancement to the software is the NetSpy-to-NetSpy capability, which enables a copy of NetSpy running on one host to communicate with one or more copies of NetSpy on other hosts. This permits a central site net administrator to view all or a subset of the response times and net utilization statistics for any VTAM domain managed by NetSpy.

Previously, NetSpy was limited to monitoring traffic within a single domain, which put a crimp on a user's ability to perform centralized monitoring.

> Version 4.0 is the fifth major revision of NetSpy since it was released in April 1987.
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"This is the type of centralized monitoring we need to manage those LANs beyond an SNA environment once LANSpy makes it into user nets," Imhoff said.

Like older versions of NetSpy, Version 4.0 provides general alerts, in which the software monitors preset threshold levels for network devices; graphic alerts, which display alert conditions in real time; and trace alerts, which key on a single device and report back the activity in real time. The new software also provides VTAM buffer statistics.

The new features of NetSpy Version 4.0 set the stage for users that want to utilize their existing investment in NetSpy to monitor a growing number of LANs, according to Brian Szabo, president of Network Intelligence, Inc., a Palo Alto, Calif., company, which is building LANSpy with Legent.

Initially, Legent plans to release LANSpy for token-ring networks and to support DOS-based workstations and servers. However, Szabo said both companies have plans to support other LAN environments, including Unix and Ethernet.

LANSpy differs from existing LAN analysis tools, Szabo said. LANSpy will collect performance statistics on physical components

(continued on page 52)

OPINIONS

LONG-DISTANCE MARKETPLACE

BY DANIEL BRIERE

Seeking truth in carrier advertising

Carriers have found they must become more innovative in advertising. Recent campaigns from the major long-distance carriers show the strain of trying to find differences — no matter how small — between their products and their competitors' offerings. For example, MCI Communications Corp. and US Sprint Communications Co. constantly compare their service pricing to AT&T's direct-dial rates, rather than to the rates AT&T charges for comparable services. But AT&T is also having problems finding a message to bring to the market, even more so than the others.

AT&T's "Put it in writing" campaign claimed that competing carriers would not back up their claims in written form, which is largely not true. And the infamous Fiji ad, in which a caller tries to reach Phoenix but instead consistently reaches Fiji, wrongly implies that it is common for competing carriers to make mistakes in switching international calls.

AT&T's current "Faster connections" campaign is worse. AT&T's main message concerns the amount of time callers "waste" because of differences in call setup times.

In the small print, AT&T reveals that call setup times for its WATS products are 4.6 seconds vs. the competitor average of 6.8 seconds. If you're not an AT&T customer, the ad says, "your employees are waiting more than 40% longer for their long-distance calls to connect. In one year, you may end up paying people thousands of dollars just to wait."

The 800 service ads are even bolder. Based on a call setup time of 5.1 seconds for AT&T and 7.1 seconds for competitors, AT&T claims that companies are losing business because customers get tired of waiting on the telephone. The ad claims, "If your business is not using AT&T 800 service, it takes more than 35% longer for your customers' calls to connect. The longer your customers have to wait, the more they may hang up, and that can cost you business." The words, "Did you know" open each ad, positioning AT&T as an educator. The problem is that this information is blatantly misleading.

Call setup time *is* important to businesses. When competitor call setup times were 12 to 15 seconds vs. AT&T's 6 to 8 seconds, I could buy this argument. However, the representation that substantial numbers of customers would terminate an inbound call because the call setup time was two seconds longer than 5.1 seconds is hard to believe. Moreover, consumers will confuse the term "connect time" with the overall time it takes for a call to be answered, over which AT&T has no control. And as for the 35% to 40% comparisons, come on.

This whole issue raises the question of the practical value of AT&T's current ad campaigns. AT&T is technically and legally correct, but wrong in practice. If AT&T considers these ads truly legitimate, then wouldn't some of these also be:

- A Tariff 12 telecommunications manager bragging about how he turned his department into a profit center. "AT&T hasn't delivered my bill in nine months, so I took my monthly payments and put them into a money market fund. Now I'm clearing 12% per annum for my department." Ad subhead: Another AT&T advantage.
- An MCI or US Sprint customer in the sales industry: "I usually spend my postdial delay time preparing for the upcoming phone call. AT&T connects me so quickly that I am never ready. I'm losing business!"

The bottom line is that carriers should educate with ads, not confuse the issue with representations of enormous percentages and misrepresentations of practical effect. ◪

Briere is president of TeleChoice, Inc., a Montclair, N.J., telecommunications consultancy specializing in long-distance service analysis and network design. He can be reached at (201) 746-0200.

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EDITORIAL

Bush administration's plans for telecom industry bode ill

Recently, the president's Council of Economic Advisors urged a lifting of the Modified Final Judgment restrictions on the regional Bell holding companies.

In an annual report to Congress, the council outlined the Bush administration's telecommunications perspective, which backs RBHC entry into manufacturing, long-distance and information services. The report said "the local telephone companies might have much to offer these markets."

We strongly disagree.

While there's much to be said for deregulation and free market forces, freeing the RBHCs may actually prove a disservice to the public interest and do little to improve national competitiveness.

Why?

Because there seems to be little rationale for giving these local carriers new opportunities to divert their limited investment resources — resources that should be devoted primarily to improving their local networks.

Users have roundly criticized the RBHCs for moving slowly in offering advanced services, such as Integrated Services Digital Networks, and upgrading public network facilities.

In their defense, the carriers cite limited resources as the reason the public network advances so glacially.

Given that, do we really need to let the RBHCs divert these precious resources to play in the highly competitive long-distance, manufacturing and information services markets? (Particularly when they are already diverting resources to major network projects abroad.)

Do we need another network equipment maker or long-distance company? Perhaps. The RBHCs may be able to offer new products and services or push prices lower.

Will the RBHCs be able to provide innovative information services that existing companies haven't provided to date? Perhaps.

But is RBHC provision of equipment, long-distance service or information services a high priority to the carriers' residential or business customers? Certainly not.

Increasing competition is a good thing, but the U.S. would gain much greater benefits by developing a more robust public net. The issue isn't so much deregulation as how to spur the evolution of the local net, which is a weak link in the telecommunications infrastructure.

Lawmakers and regulators would do better to focus on what they can do to speed that evolution than worrying about whether the RBHCs get to try their hands in markets already served well by current suppliers. ◪

OPINIONS

THE FUTURE OF NETWORKING

BY JAMES HERMAN

The brave new world of object orientation

Better get familiar with the multifaceted concept of object orientation; soon we will be swimming in objects.

Essentially, an object is an abstraction of something that physically exists, described only in terms of what it is, how it communicates and what it does.

For example, an object-oriented network management system knows that an object called a modem has interfaces, generates specific alarms and performs certain loop-backs. Other properties that aren't pertinent, such as color, weight and size, are not included in the object definition.

An object is defined by properties, called attributes. These include the object's condition (on or off) or the version of software it's running. Objects can also emit notifications such as alarms and requests for information.

Objects respond to requests for action, such as "Loop back," "Perform a calculation" or "Change state." A screen image of the object or a piece of software that knows how to create the image might also be included in the object's description.

Many products claim to be object-oriented. The simplest and loosest meaning of the term generally refers to software that has been written in the point-and-click style, rather than the clunky command-line mode.

When a graphical user interface is designed to give access to the workings of an object-oriented software system, the results are flexible and extendable. NeXT, Inc.'s NeXTStep user interface is a good example.

A second meaning of object orientation that is becoming widespread refers to a data modeling technique. In a rigorous object-oriented approach, objects are not just made up willy-nilly. Rather, the process involves deriving more specific objects from previously defined, and more general, objects.

General properties are defined first so that they can be shared by the maximum number of specific objects, a process that imparts an integration and uniformity that makes software easy to use.

Object-oriented data models are the cornerstone of most efforts to solve the multivendor network and systems management problem. The collection of object definitions, known as object classes, that a given management system can work with is called the Management Information Base (MIB).

> Standards groups and vendors are defining many kinds of object classes.
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Standards groups and vendors are defining many kinds of object classes, resulting in a variety of MIBs. MIB proliferation is one of the most serious stumbling blocks in the effort to standardize network management.

Objects further separate data from software. If software can be written to operate on objects driven entirely by the object descriptions, then that software can adapt to an ever-changing environment of systems and applications.

All parameters governing the algorithms and operations of the software are organized into object definitions that can be easily edited and extended. All the user needs to do is change the object definitions, and the program will be able to handle a new type of resource.

All the software that is unique to the object and knows how to manipulate the real world resource itself is carried within the object and is safely isolated from changes in other parts of the software system.

A third common meaning of object orientation is that it is an operating system environment in which objects interact by sending messages to one another. The messages activate pieces of software code sometimes called an object's methods.

These message-passing systems are a new way of structuring software. Software is written in small modules that each handle a particular kind of message about a specific type of object.

This bottom-up approach differs greatly from the top-down thinking of structured programming methods. Structuring software into interacting objects opens up the possibility of constructing future applications by collecting and adapting previously written generic objects.

Many in the communications industry are excited about this dream of reusing generic objects. In addition, the message-passing paradigm is especially adaptable to distributed computing environments where the objects interact across networks.

With everyone defining objects of all types for all kinds of purposes, confusion inevitably results. In fact, there are many competing schemes for standardizing object definition.

Some vendors are developing data bases to store all these objects and access them according to object-oriented naming schemes. In fact, users may soon find that object-oriented data bases have obviated the need for SQL as the standard means of accessing data bases.

Users will have a multitude of network management objects and software objects. They will have to distribute new releases of objects, and a whole new set of disputes about object compatibility and interoperability are bound to arise. ▣

Herman is a principal at Northeast Consulting Resources, Inc., a Boston-based consulting collaborative that focuses on strategic management of information technology.

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TELETOONS

BY FRANK AND TROISE

I'm Sorry it's taking so long to bring up your file .. seems the consultant we were working with took a full-time position with our... ahem!.. competition.

LETTERS

A loaded statement

I found Arthur Barber's recent opinion column regarding allocation of costs for telephone company technological investments most interesting and insightful ("Little old ladies shouldn't have to pay for SONET," *NW,* Jan. 28).

However, the tone of the first sentence was inconsistent with the rest of the article: "The view that the purpose of regulation is to protect the public interest has faded."

The expectation that this phrase invokes is that we are about to be subjected to another jeremiad about the evils of government regulation.

The years following the Reagan administration's disastrous social experiments with deregulation in the airline, financial, communications and other industries have fine-tuned most Americans' "BS" detectors to go off at the slightest hint that someone out there still believes that Adam Smith's "invisible hand" is operational.

Yet the paragraphs that followed indicate just the opposite — that regulation per se is not the problem; it is outdated regulation that gives us all ulcers.

In short, be aware that some phrases are ideologically loaded. When you refer to a general topic like "government regulation," you are addressing a political fracture point that can cause some readers to lose interest.

As it is, I found Barber's piece to be that rare combination of providing new information in a clear manner, staking out the issue's territory and demarking a position.

Dan Flasar
Systems manager/analyst
Washington University Clinical
Research Center
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FEATURES

Dealing with systems integrators

How to find a systems integrator with the right stuff.

CONTINUED FROM PAGE 1
handle it. But there are also excellent reasons to be wary at this time.

Strong demand for the services of integrators is matched by an even stronger surge in new firms. Some of these newcomers have little experience in systems integration; indeed, some have very little networking experience at all.

Such firms often promise more than they can deliver, and the stories of integrator relationships that have gone sour abound. Numerous examples exist of systems integration projects that failed, were completed late or were grossly over budget. Some of them are:

- A systems integrator designed and put together a $10 million network project for the State of Oklahoma's Finance Office last year. According to published reports, it didn't work properly and payments to the state's employees and suppliers were delayed for nearly two months.
- A systems integrator designed and configured a $20 million network for the county of San Diego in California. According to published reports, it took the county several lawsuits and more than six years to get the net project under way in 1989.

Such horror stories should not detract from the advantages of dealing with systems integrators. Building today's increasingly complex networks may require specialized skills.

Still, there have been problems, and network managers can minimize the chances of similar woes by doing more upfront work when it comes to selecting a systems integrator.

In fact, the strong competition in the systems integration market has allowed users to build special safety nets into their contracts. For example, some recent contracts include economic penalties on the integrator if it misses specified installation target dates. Other contracts grant user organizations escape clauses so that they can terminate bad relationships.

There are several problems to avoid and points to insist on in the user-integrator relationship. These revolve around five main topics: Setting out to select an integrator; writing a contract that protects a user during an integrator-managed project; monitoring the performance of an integrator while it is conducting a project; resolving disputes with an integrator; and avoiding such little-known pitfalls as the use of software licensed by the integrator.

The last point is troubling, for if the user-integrator relationship is terminated, the user could face a problem if the software had been leased to the integrator. That and other software-related problems will be covered later in this article.

As networks change, so do the firms that integrate them. At one time, the primary chore of these firms was writing custom mainframe software. Now systems integrators largely specialize in local-area networks, multiple LAN hookups and client/server development projects. They also design and install wide-area nets.

Companies in the systems integration field fall into one of three categories. There are the giant national firms, such as Electronic Data Systems Corp. (EDS) and the Big Six accounting firms, of which Arthur Andersen & Co. is the largest.

Then come the large equipment vendor companies, such as IBM, Digital Equipment Corp. and Unisys Corp., which have divisions that provide systems integration

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services. Some of the regional Bell holding companies have units that do integration work as well.

Then there are regional and local organizations, the latter including some small firms that specialize in LANs.

The top five systems integrators are Andersen Consulting, DEC, EDS, IBM and Unisys, all of which have integration-related revenues of more than $500 million annually. Andersen Consulting, EDS and IBM have more than $1 billion in integration revenues.

In contrast, some small computer dealers calling themselves systems integrators may do several thousand dollars in business installing LANs.

Making the selection

With such a wide range of choices, selecting the right systems integrator can be a challenge. Net managers generally start by doing a needs assessment for their company. Once the networking project is defined, the selection process begins. A request for proposal is sent out to a list of systems integrators. The replies are compared, and the field is narrowed to a few prime candidates.

"We looked at 22 systems integrators over six months and narrowed the field to a few strong companies," says David Evans, legal administrator at Bass, Berry & Sims, a Nashville law firm.

Then a more in-depth study of the systems integrators is carried out. Net managers should always check for relevant experience by asking for and carefully checking references. "The systems integrator told us they practically invented a new application," says a net manager for a Midwest food products company who requested anonymity. "We called some past clients and found out that [the systems integrator] didn't do as much as they told us they did."

After ensuring that the systems integrator has the relevant background, check to make sure they have the technical talent to handle the job. This can be a fairly straightforward process. If it's a LAN project and you've opted for a Novell, Inc. network, ask if they have Certified NetWare Engineers on board.

If a company looks as though it can handle the technical aspects of the job and it is considered an eligible candidate for price and other reasons, users should still be wary. A check of the integrator's finances is essential because of the relatively high failure rate of small and midsize integration firms (see "Essential: Check your integrator's financial health," page 38).

A net manager may not have the time to search for and select a systems integrator. If that's the case, the net manager can turn to an independent consulting firm specializing in this area, but the selection of the consultant is in itself a critical task (see "Adding outside muscle to keep systems integrators in line," this page).

Drawing up a contract

Once a systems integrator is chosen, the next critical step is to draw up a contract to cover as many of the project's requirements as possible. This is critical.

What goes into the contract determines how the user-systems integrator relationship will proceed. "I see the contract process as an opportunity for [the user company's] senior management to talk about all aspects of the relationship," says Robert Zahler, a partner at Shaw, Pittman, Potts & Trowbridge, a Washington, D.C. law firm.

An important reason to draw up a contract is because of high company turnover rates. "Only a small number of people in both organizations know what the deal is," Zahler says. "Over a long term, the people who did the negotiating won't be around."

The contract process takes from three to six months. "During this time, the systems integrator is anxious to lock up the deal," Zahler says. "Because of this, the [net manager's organization] has all the leverage before a contract is signed."

"We negotiated a very aggressive contract," Evans says. "We're a law firm, and our lawyers drew it up; it's over 60 pages long."

Perhaps some of the most important points to negotiate are how to resolve disputes. Curt Meltzer, vice-president for technology at Hildebrandt, Inc., a Somerville, N.J., technical consulting firm, has negotiated contracts that call for economic penalties if the systems integrator does not meet certain performance goals. "We have the [user company] set up an escrow account and make payments into it until the problem is resolved," Meltzer says.

Don Holland, a partner at Holland, Shipes, Vann, PC, an independent consulting firm in Atlanta, takes an even tougher stance. Before his firm's clients make a payment, they test the network. The contract states that the systems integrator is responsible for fixing any performance problem.

"It's hard to define performance," Holland says. "So we have a provision that says we are the final arbiters of performance." If the systems integrator cannot fix the problem, Holland's contract has a provision that allows the user company to call in another group to remedy the situation. And the user can deduct the cost of hiring this other group from the integrator's fee.

Software concerns

One aspect to the integration relationship that is rarely discussed is whether there are legal restrictions on using software that has been acquired by the systems integrator.

Some consultants warn that the software aspects of an integration project are particularly tricky. Zahler, for example, says that a contract with a systems integrator might lock a user into a difficult position if the user decides to turn to an outsourcing firm in the future. His advice: "Do not sign a software license that doesn't allow [the licence] to be turned over to a third party."

A problem can also arise if the systems integrator modified the source code of an existing product for a user's network. The license may be fine for the user and the systems integrator, but if a third party comes in to operate the network, a new licensing fee may need to be arranged.

A more sticky issue concerning software is who has access to the source code. This should be worked out in the contract to avoid future problems.

For example, many software houses will not release the source code — even to the systems integrators, OEMs and resellers they work with on a regular basis.

There's a good reason for this. The software houses naturally want to protect their trade secrets and keep control over the code. However, it is possible to break through the software firm's resistance.

Yielding to this insistence that users have access to the source code, some software firms have allowed limited access through an innovative legal procedure. They permit a source code escrow account to be established; then the software vendor gives a copy of the source code to a third party. If the software house fails to deliver a satisfactory product or if it goes out of business, the user gets the source code from the third party.

A Hartford, Conn.-based insurance company put a source code escrow account provision in its contract with a systems integrator. The company's network manager, who requested anonymity, says, "This way, if the in-

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Adding outside muscle to keep systems integrators in line

There's a new trend to manage outside systems integrators through consultants who serve as liaisons between user organizations and systems integrators.

Of course, this involves an additional expense and adds the burden of choosing a consultant to the responsibility of finding an integrator. But there are some advantages.

The primary benefit is that consultants can save the time of internal staff. They can do much of the work in the selection process — perform a needs assessment, issue a request for proposal, screen the applicants — and they can help negotiate the contract. The final decision is naturally left to the user organization.

User firms are also engaging consultants after they've selected their systems integrator. In this case, the consultant's task is to keep track of the project and make certain it is meeting both performance and scheduling objectives.

Again, the time savings can be significant. On complex development projects, in-house managers could spend all of their time in consultation with the integrator.

Starting the relationship

Consultants that specialize in selecting and liaising with systems integrators are usually brought into a networking assignment shortly after the user organization decides that a systems integrator is needed.

"We rank the systems integrators who responded to the RFP and make a specific recommendation to our client," says Curt Meltzer, vice-president of technology at the Somerville, N.J., consulting firm Hildebrandt, Inc.

Consultants that offer this type of service generally do not recommend which systems integrator the user should choose. Usually, they list the pros and cons of each systems integrator competing for the job. The user then makes the final choice, based on this ranking.

For an additional charge, most consultants will negotiate a contract with the systems integrator. This service can be attractive for network managers who do not have previous experience in negotiating similar arrangements.

Many users who have involved consultants in this manner say they are convinced the negotiations proceeded more smoothly because a consultant participated in the talks.

Part of the contract negotiation is dedicated to setting performance goals for the systems integrator and specifying which party decides if the goals have been met. Having previous experience in conducting negotiations is a clear asset in this process.

For example, some consultants have been able to secure contract terms that many users might not have believed possible.

Don Holland, a partner at the Atlanta consulting firm of Holland, Shipes, Vann, PC, has negotiated contracts that allow the user to bring in another systems integrator to fix a problem the original systems integrator cannot fix.

These contract provisions also state that the user is allowed to deduct the fee for using the second integrator from the fee of the first.

Furthermore, no outside arbiter is necessary to decide when the second integrator is to be called in. The contract specifies that the user is the final judge of when corrective action is warranted.

Another advantage to using the consultant as a liaison to resolve disputes is what Meltzer calls the one-to-many relationship.

"We're working for many clients with similar networking needs, and in many cases, we are dealing with the same systems integrators," Meltzer explains. "If a dispute arises, we can tell a systems integrator, 'We cannot recommend you on a project like this again.' "

The selection process

Dealing with consultants can be just as difficult as dealing with systems integrators, and they should be selected just as carefully.

One essential is to determine that the consulting firm itself does not do integration work on the side.

Similarly, the consulting firm should not sell networking products. Networking consultants, like some of the smaller systems integrators, may also own or operate computer dealerships.

Checking the consultant's references is necessary, and in many cases, there should be contracts to spell out the consultant's responsibilities. But the selection and contract process need not be as arduous as selecting the systems integrator. After all, the process is supposed to save the internal staff's time.

In the process of dealing with integrators, the use of consultants is by no means a panacea. Ideally, it should bring experience and a new perspective to the selection process and eliminate headaches.

There is, of course, the additional expense of hiring the consultant, but this cost is often offset by the time a net manager saves having these duties carried out by a specialist.

— Salvatore Salamone

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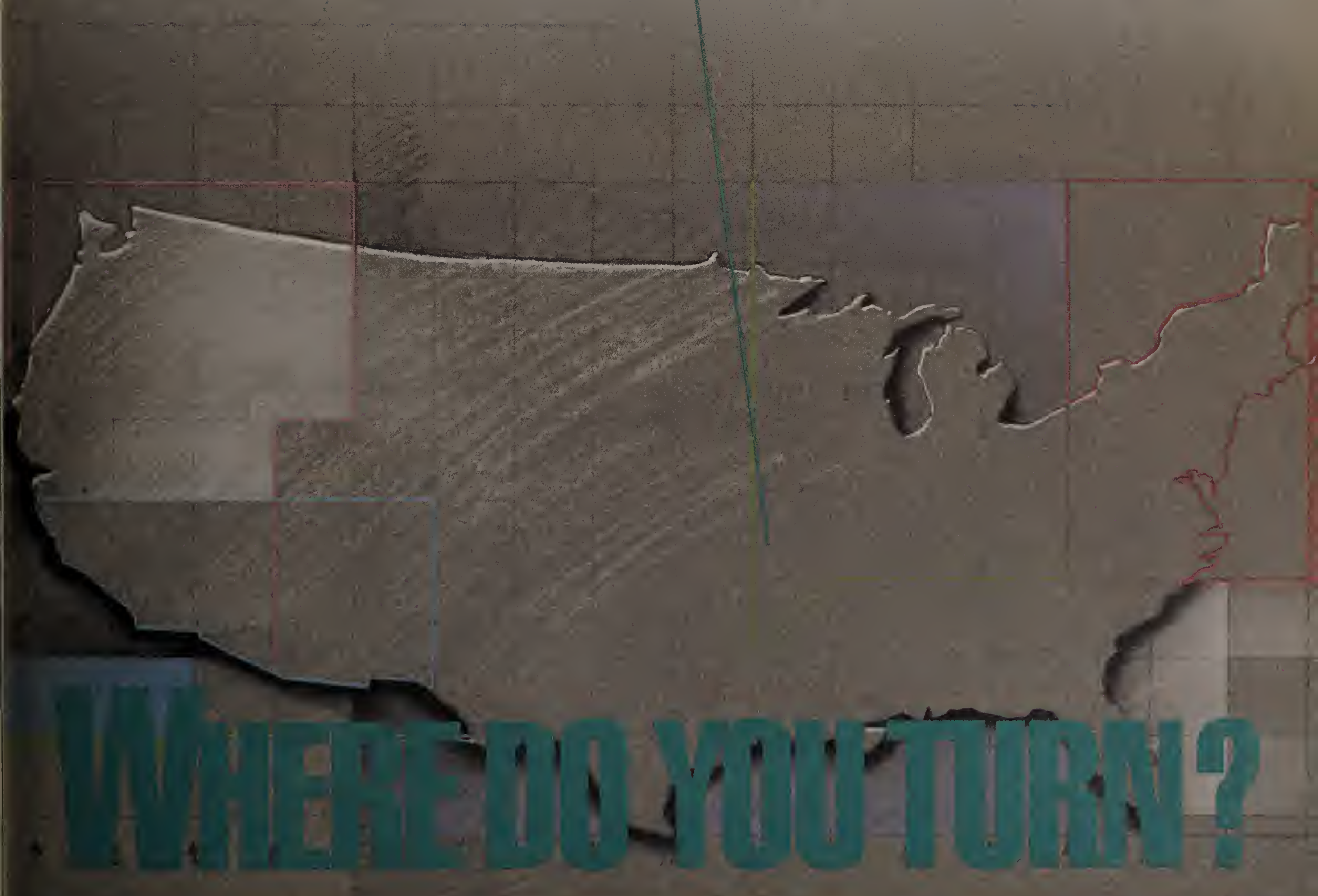

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tegrator doesn't produce the results we want, we don't lose our entire investment."

Checking up

Since the risks of the failure of a relationship with a systems integrator are relatively high, net managers should proceed with extreme caution.

Of fundamental importance is a check of the potential integrator's background to make sure the firm has the relevant experience to complete the job. Also check the systems integrator's financial stability and its commitment to continuing in the integration field.

After selecting one company to handle the networking project, a contract must be written that spells out who is responsible for each part of the project and how disputes will be resolved.

From the user's point of view, it would be ideal to have a contract that allows the network manager to withhold payment whenever the project milestones are not met.

While net managers should not be consumed by these projects, they may want to take a long-range look at their networking needs before they start.

"A company should ask what drove it to a systems integrator," Zahler says. "It's usually a need to make substantial changes."

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Essential: Check your integrator's financial health

Will your chosen systems integrator stay in business long enough to finish the job?

That's a question well worth asking. Many networking projects would be crippled — and the careers of the managers involved hampered — by the demise of the chosen integration firm in mid-project.

Yet the experience of many network managers who have worked with integrators is that individual systems integration firms have remarkably short life spans.

Dave Evans, a legal administrator at Bass, Berry & Sims, a Nashville law firm, evaluated 22 systems integrators before selecting Dallas-based Micro One to conduct a network project for his firm.

During the selection process, which took six months, more than a third of the 22 systems integrators failed in business or left the industry.

The lesson learned: Check the financial health and commitment of the firms seeking to be your integrator as closely as you check their technical expertise.

Check commitment

Not merely the finances should be scrutinized; experienced users recommend a close study of a systems integrator's commitment to the industry.

Some firms pop into integrating from reselling or consulting, only to pop out again when they discover the field is highly competitive. "We look for a financially sound company that's committed to staying in the field," Evans says.

His advice is to check only the leading candidates for the job. "Once we've narrowed the field down a little, we ask systems integrators for financial records," he says. Other suggestions on how to check a systems integrator's financial stability, recommended by Evans and Don Holland, a partner at the Atlanta technical consulting firm of Holland, Scipes, Vann, PC, are:

- Ask the systems integrator for a list of creditors and call them to see if the systems integrator has a good credit history and if it pays its bills on time.
- Ask to see the systems integrator's own financial books. The systems integrator doesn't have to comply, but at this stage of the process, the net manager is working from a position of strength because there are many systems integrators from which to choose.
- Use an on-line financial records service. For example, D&B Dun's Financial Records, offered through The Dun & Bradstreet Corp. and available through the Dow Jones News Retrieval service, contains financial information on 750,000 public and private companies. The information includes a corporate profile, a financial summary of the company and as many as three years of the firm's balance sheets and income statements.

In addition to performing a financial background check on a systems integrator, network managers should negotiate a payment plan that won't leave them stranded if the systems integrator goes out of business in the middle of a project.

"We negotiate contracts that call for payments as equipment and services are delivered," Holland says. "We don't pay ahead of schedule. The systems integrator is not going to live off of us."

— *Salvatore Salamone*

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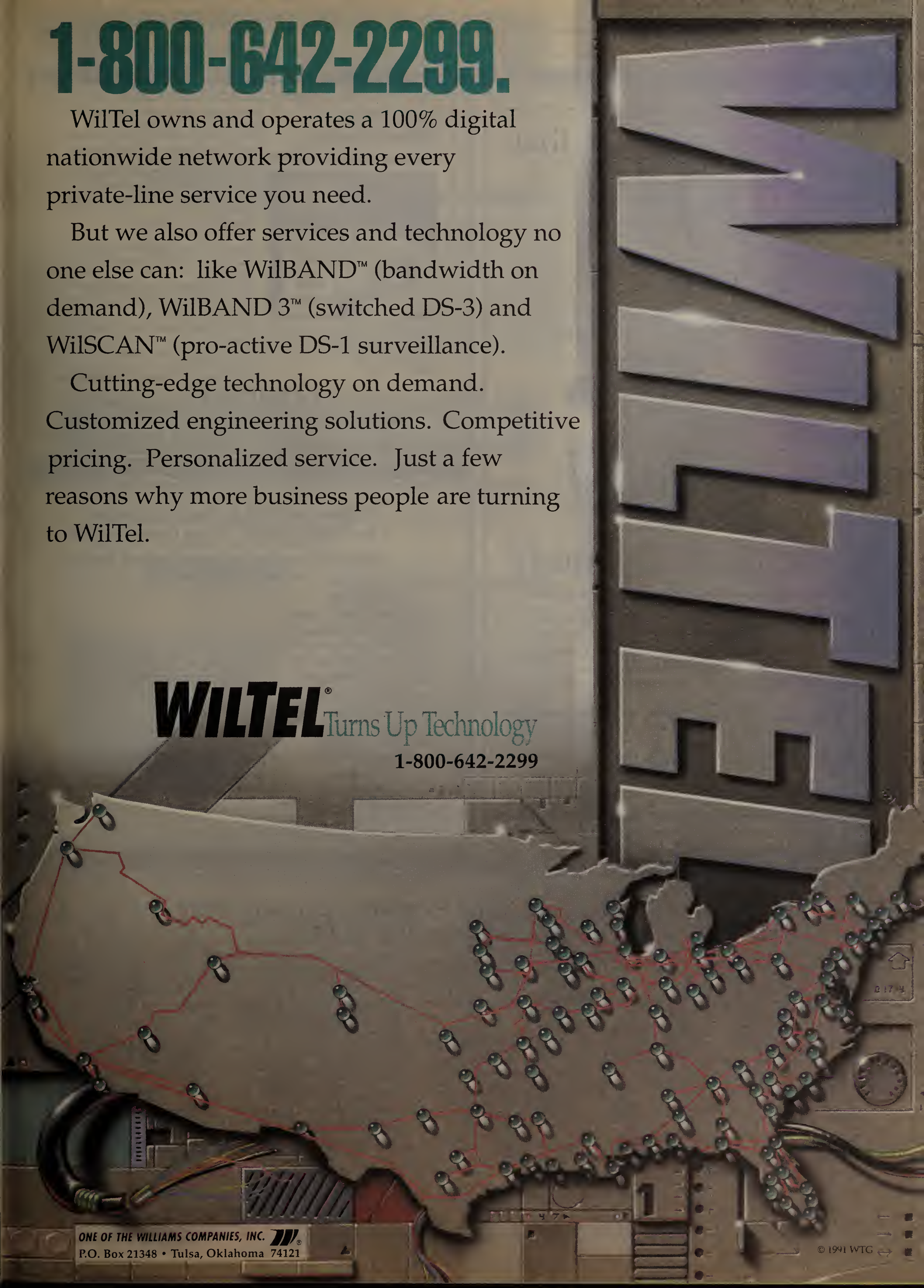

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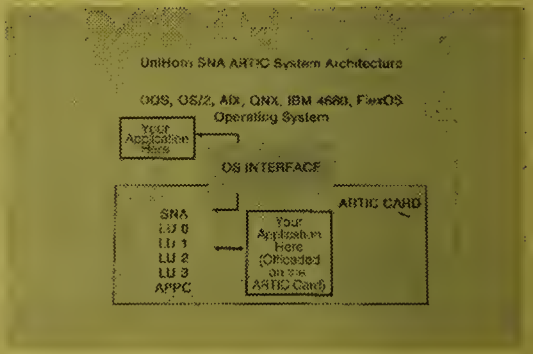
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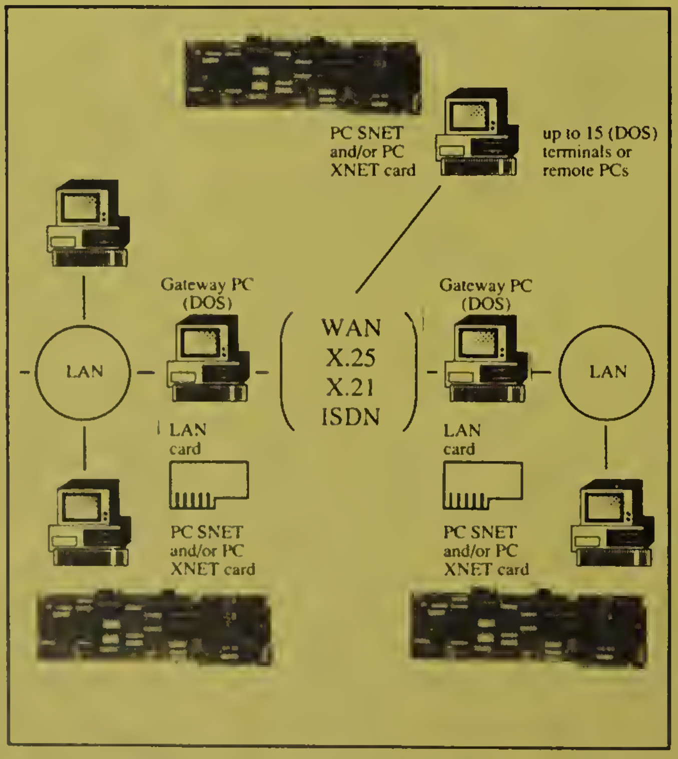
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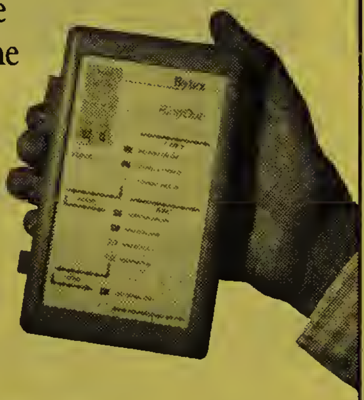

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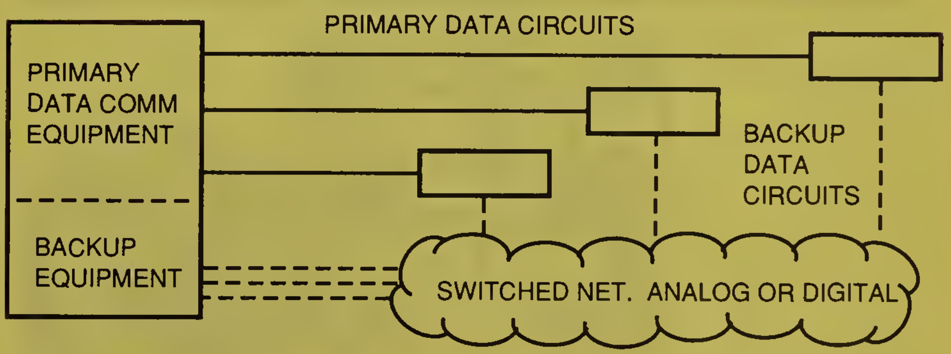

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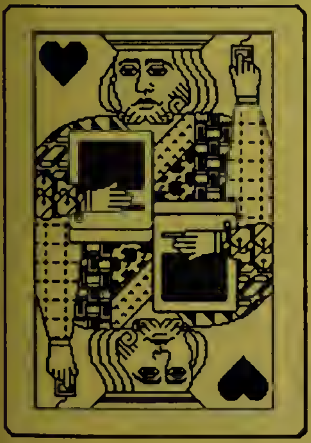

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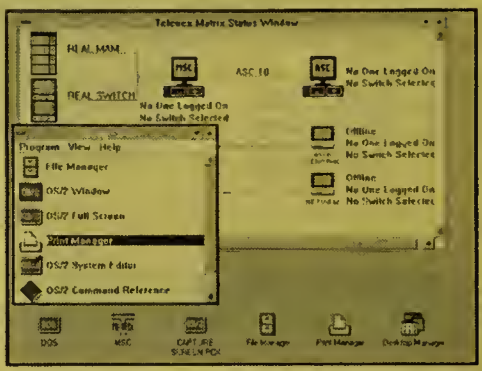

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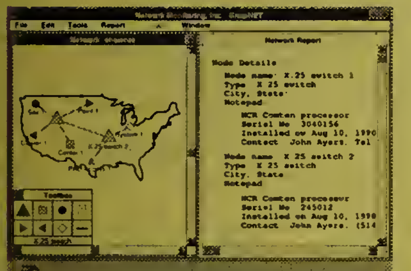
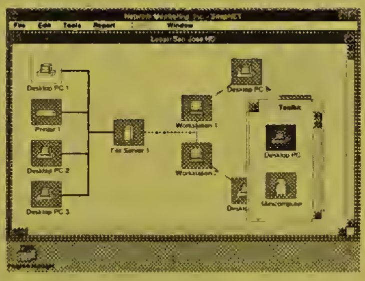


Place a node or link simply by pointing and clicking. WAN and LAN reports will give you complete summaries.



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PC LAN/WANG VS CONNECTIVITY

Wang VS Users:

Hitch It or Ditch It

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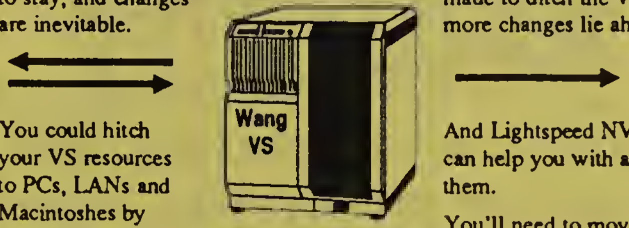

However, if the decision has been made to ditch the VS, more changes lie ahead.

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You'll need to move all the data off the VS, convert documents to new word processing formats, and somehow run the primary VS procedures while you're in the process of migrating away. You'll want to run both systems parallel for awhile, too.

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MacSoft

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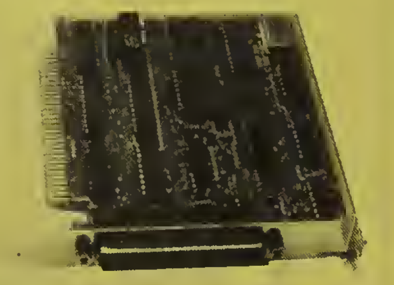

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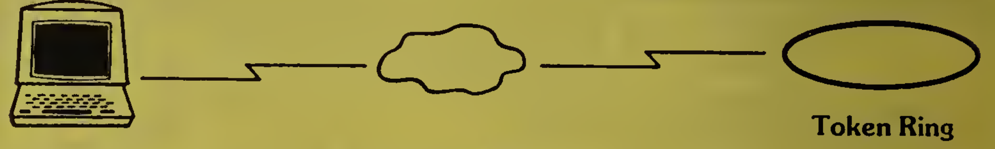

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C. Please Answer ALL Questions, Sign & Date the Form.

1 Industry: (check one only)

01. ☐ Manufacturers (other than computer/communications)
02. ☐ Finance/Banking
03. ☐ Insurance
04. ☐ Real Estata
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Ratail/Wholesale Trade
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
13. ☐ Government Stata/Local
14. ☐ Government Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/Systems House
22. ☐ Distributor, Computer Related
23. ☐ Distributor, Communications Related
24. ☐ Other ____________

2 Job function: (check one only)

1. ☐ Networking Management (Responsible for both voice & data)
2. ☐ MIS Management (VP, Dir., Department Head)
3. ☐ Corporata Management (Chairman, President, Owner, General Manager, CEO, CIO, VP)
4. ☐ Data Communications Management (Responsible for data only)
5. ☐ Telecommunications Management (Responsible for voice only)
6. ☐ Financial Management
7. ☐ Engineering Management
8. ☐ Consultant (Independent)
9. ☐ Other ____________

3 What is the scope of your involvement in purchase decisions for Network/ Communications products + services? (check one only)

1. ☐ Enterprise Wide (Organization/Subsidiary/Division)
2. ☐ Multi Enterprise (Consultants)
3. ☐ Department Wide

4 What is the total number of sites for which you have purchase influence?

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1

5 Your primary responsibility: (check one only)

1. ☐ Both Data + Voice
2. ☐ Data Networking Only
3. ☐ Voice Networking Only
4. ☐ None

6 Which transmission media do you use in your network: (check all that apply)

Public:
01. ☐ Switched-Based (DDD, Wats, Megacom, etc.)
02. ☐ Leased Line (not including T-1)
03. ☐ T-1
04. ☐ Fractional T-1
05. ☐ T-3/SONET
06. ☐ Broadband
07. ☐ ISDN

Private:
08. ☐ Satellite
09. ☐ Microwava
10. ☐ Fiber Optic

7 Is your network: (check all that apply)

LOCAL AREA NETWORK
1. ☐ Local (within building)
2. ☐ Local (in a campus environment)

WIDE AREA NETWORKS
3. ☐ International
4. ☐ National
5. ☐ Regional (several states)
6. ☐ Metropolitan

8 What is your network architecture? (check all that apply)

1. ☐ SNA
2. ☐ DECNET
3. ☐ OSI
4. ☐ GOSIP
5. ☐ MAP/TOP
6. ☐ TCP/IP
7. ☐ DCA (UNISYS)
8. ☐ OTHER ____________

9 What is your LAN Operating System? (check all that apply)

01. ☐ 3COM (3+, 3+open)
02. ☐ LOCAL TALK (APPLETALK)
03. ☐ BANYAN (VINES)
04. ☐ DCA (IRMALAN)
05. ☐ IBM (LAN Server)
06. ☐ IBM (PC LAN PROGRAM)
07. ☐ MICROSOFT (LAN MANAGER)
08. ☐ UNGERMAN BASS (NET/1)
09 ☐ NOVELL (NETWARE)
10 ☐ TOPS
11. ☐ PROTEON (PRONET)
12. ☐ OTHER ____________

10 What is your LAN environment? (check all that apply)

1. ☐ 4M TOKEN RING
2. ☐ 16M TOKEN RING
3. ☐ ARCNET
4. ☐ ETHERNET
5. ☐ STARLAN
6. ☐ FDDI
7. ☐ LOCALTALK
8. ☐ 10BASET
9. ☐ OTHER ________

11 Which operating systems do you utilize? (check all that apply)

1. ☐ IBM DOS (VSE)
2. ☐ UNIX
3. ☐ OS/2
4. ☐ OS/2 Extended Edition
5. ☐ MVS
6. ☐ VM
7. ☐ VMS
8. ☐ XENIX
9. ☐ PICK
0. ☐ OTHER ______

12 Please indicate by vendor the number of mainframes/minicomputers installed in your network.

VENDOR	MAINFRAMES A	MINIS B
01. DEC		
02. IBM		
03. AMDAHL		
04. AT&T		
05. BULL HN IS		
06. NCR		
07. DATA GENERAL		
08. WANG		
09. HEWLETT PACKARD		
10. PRIME		
11. TANDEM		
12. UNISYS		
13. CONTROL DATA		
14. OTHER		

13 Please indicate by vendor the number of microcomputers/workstations:

A. Presently installed in your network.

B. The approximate quantity you plan to install in the next 12 months.

MICROCOMPUTER/ WORKSTATION/ VENDOR	PRESENTLY INSTALLED A	PLAN TO INSTALL NEXT 12 MONTHS B
01. PCs based on 80286 chip		
02. PCs based on 80386 chip		
03. PCs based on 80486 chip		
04. 8086/8088		
05. Macintosh		
06. RISC-based workstations		
07. UNIX-based workstations		

14 What is your planned PC standard? (check all that apply)

1. ☐ EISA
2. ☐ MCA
3. ☐ NUBUS (MACINTOSH)

15 For which areas outside of the U.S. do you have purchasing influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East

16 Check ALL that apply in columns A and B

A) I am prasently involved in the purchase process for the following products/services:

B) I plan to purchasa the following products/ services in the next 12 months:

Presently Involved A	Plan to Purchase B	LOCAL AREA NETWORKS:
01. ☐	☐	Local Area Networks
02. ☐	☐	LAN Servers
03. ☐	☐	LAN Services
04. ☐	☐	Cables, Connectors, Baluns
05. ☐	☐	Bridges, Routers, Gateways
06. ☐	☐	UPS
07. ☐	☐	LAN Storage Devices
A	B	COMPUTERS/PERIPHERALS:
08. ☐	☐	Micros
09. ☐	☐	Minis
10. ☐	☐	Mainframes
11. ☐	☐	Front End Processors
12. ☐	☐	Terminals
13. ☐	☐	Laptops
14. ☐	☐	Printers
15. ☐	☐	Work Stations
16. ☐	☐	Cluster Controllers

(continued on next column)

Presently Involved A	Plan to Purchase B	SOFTWARE:
17. ☐	☐	Network Management
18. ☐	☐	Micro to Mainframe
19. ☐	☐	Network Security
20. ☐	☐	Call Accounting
21. ☐	☐	Distributed DBMS
22. ☐	☐	Communications Softwara
23. ☐	☐	Applications Softwara
24. ☐	☐	Network Operating Systems Software
25. ☐	☐	EDI Software
26. ☐	☐	E-Mail Software
A	B	DATA COMMUNICATIONS:
27. ☐	☐	Modems (over 9.6kbps)
28. ☐	☐	Modems (under 9.6kbps)
29. ☐	☐	T-1 Multiplexers
30. ☐	☐	T-3 Multiplexers
31. ☐	☐	Fractional T-1 Multiplexers
32. ☐	☐	Data Switches
33. ☐	☐	Matrix Switches
34. ☐	☐	Packat Switches
35. ☐	☐	Protocol Converters
36. ☐	☐	Network Management Systems
37. ☐	☐	Terminal Emulation Boards
38. ☐	☐	Facsimile Machines
39. ☐	☐	Diagnostic Tast Equipment
40. ☐	☐	DSU/CSU
41. ☐	☐	Data Security
42. ☐	☐	Data Compression Equipment
43. ☐	☐	Network Adaptar Boards
44. ☐	☐	Microwave
45. ☐	☐	Messaging Softwara
A	B	TELECOMMUNICATIONS:
46. ☐	☐	PBXs (over 1000 lines)
47. ☐	☐	PBXs (200 - 1000 lines)
48. ☐	☐	PBXs (under 200 lines)
49. ☐	☐	Key Systems
50. ☐	☐	Automatic Call Distributors
51. ☐	☐	Voice Messaging Systems
52. ☐	☐	Video Teleconferencing Systems
A	B	SERVICES:
53. ☐	☐	Switched Voice
54. ☐	☐	Dedicated Leased Lina
55. ☐	☐	T-1
56. ☐	☐	T-3
57. ☐	☐	Digital Data
58. ☐	☐	Packat Switched
59. ☐	☐	Centrax
60. ☐	☐	Central Office Lan
61. ☐	☐	Satellite
62. ☐	☐	On-Line Information
63. ☐	☐	ISDN
64. ☐	☐	EMail
65. ☐	☐	VSAT

17 Estimated value of networking equipment and services:

A: Which you helped specify, recommend or approve in the last 12 months?

B: Which you plan to help specify, recommend or approve in the next 12 months?

A	B	
1 ☐	☐	$100 million and over
2 ☐	☐	$50 - $99.9 mill
3 ☐	☐	$25 - $49.9 mill
4 ☐	☐	$20 - $24.9 mill.
5 ☐	☐	$10 - $19.9 mill.
6 ☐	☐	$5 - $9.9 mill.
7 ☐	☐	$1 - $4.9 mill.
8 ☐	☐	$500,000 - $999,999
9 ☐	☐	Under $500,000

18 Estimated gross annual revenue of your entire company/ institution: (check one only)

1. ☐ over $10 billion
2. ☐ $1 to $9.9 bill.
3. ☐ $500 to $1 bill.
4. ☐ $100 to $499.9 mill.
5. ☐ $50 to $99.9 mill.
6. ☐ $10 to $49.9 mill.
7. ☐ $5 to 9.9 mill.
8. ☐ under $5 mill.

19 Estimated number of employees for your entire corporation:

1. ☐ over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ under 500

20 Which of the following ISDN products do you plan to purchase in the next 12 months? (check all that apply)

1. ☐ Basic Rata Interface Terminal Adapters
2. ☐ Primary Rata Interface Equipment
3. ☐ Voice/Data terminals
4. ☐ Voice-only terminals
5. ☐ Data-only terminals

21 From which of the following vendors will y consider buying your PBX/Central Office Switch? (check all that apply)

A PBX	B COS	
A ☐	☐	AT&T
B ☐	☐	ALCATEL
C ☐	☐	ERICSSON
D ☐	☐	FUJITSU
E ☐		HARRIS
F ☐		HITACHI
G ☐		ROLM
H ☐		INTECOM
I ☐		MEMOREX TELEX
J ☐		MITEL
K ☐	☐	NEC
L ☐	☐	NORTHERN TELECOM
M ☐		SAMSUNG
N ☐	☐	SIEMENS
O ☐		STROMBERG-CARLSON
P ☐		TOSHIBA
Q ☐	☐	OTHER ____________

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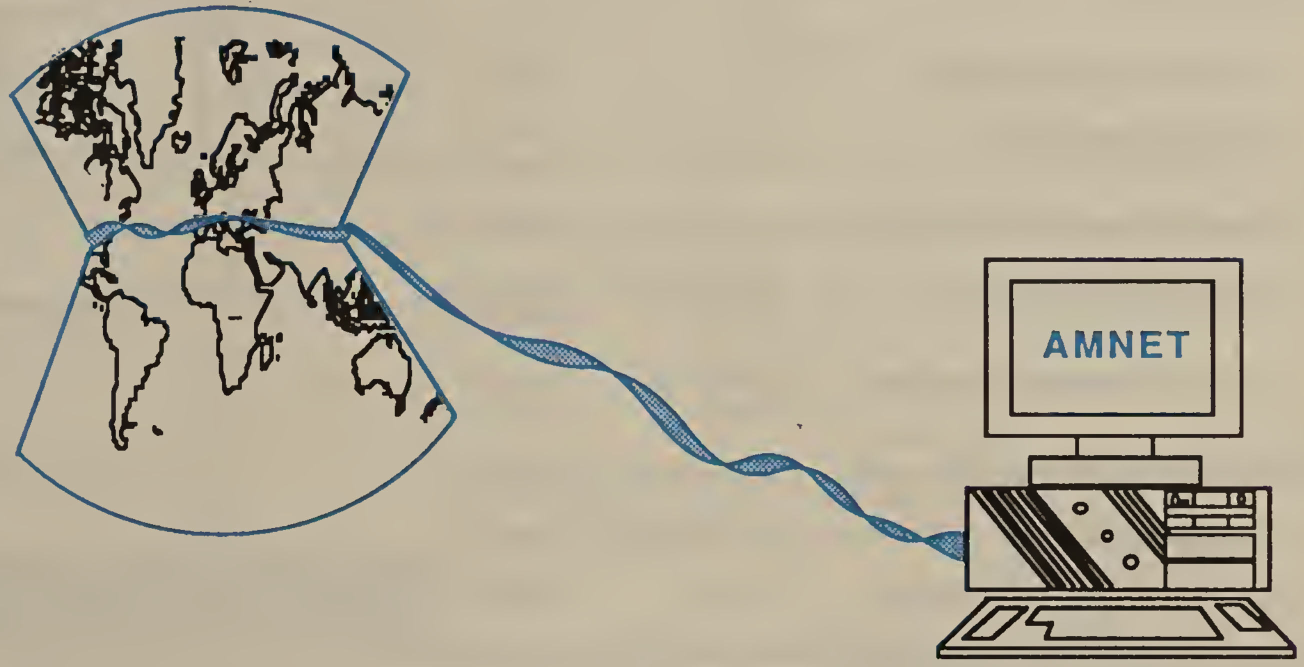

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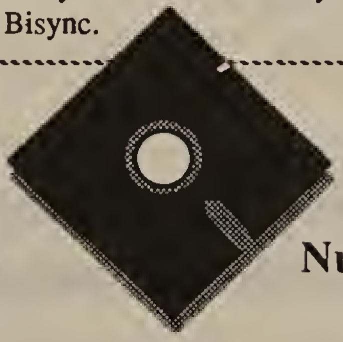

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Legent plans LAN NetSpy

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in the LAN, setting off an alert if they exceed preset thresholds. It will also check on so-called token turnaround times, as well as component statistics for file servers and LAN nodes.

Szabo said LANSpy will be offered as software that resides on each node in the LAN and will interface to NetSpy.

One possible limitation of the software is that LAN users will not initially have access to data collected by LANSpy; LANSpy will only feed the data to NetSpy on a host.

This could preclude on-site-LAN administrators from monitoring the LAN by day and offloading those chores to a corporate data center at night.

Ray Picard, a senior systems programmer at Konica Business Machines USA, Inc. in Windsor, Conn., and a beta user of NetSpy 4.0, said the software enhancements provide him with peace of mind that Legent is prepared to support performance monitoring for LANs.

"We're a single-mainframe environment right now, but PCs are multiplying in our company, and we'll be moving to LANs in the future," Picard said. "It's good to know we'll be able to monitor all that traffic from a central point."

Dave Gruzeski, a senior systems programmer at General American Life Insurance Co. in St. Louis, which is also beta-testing NetSpy 4.0, said the LANSpy product is certainly needed by MIS departments.

"LAN administrators, by and large, don't report to the mainframe people anyway, so they've got plenty of latitude to monkey around with stuff," Gruzeski said. "This type of product will help keep them honest. Any type of product that enables us to centrally acquire LAN info is going to help immensely."

Both Gruzeski and Picard said the new software was easy to install and has performed well.

Pricing for NetSpy Version 4.0 starts at $13,860 for a permanent license and varies depending upon mainframe class. It is available now.

For further information, contact Legent at 2 Allegheny Center, Pittsburgh, Pa. 15212, or call (412) 323-2600. ◻

Dealing with integrators

continued from page 38

Generally, users need the services of a systems integrator because they don't have the in-house technical expertise to carry out a job.

Zahler says that bringing in a systems integrator involves a kind of cultural change.

Outsourcing

In many cases, Zahler asserts, a company that chooses systems integration will find it difficult to retain its in-house staff and may eventually outsource its net.

So while net managers may think they are looking at a three- to five-year commitment to a systems integrator, they may really be facing a much longer term relationship with an outside organization. And thus, the lessons learned in dealing with systems integrators could be valuable in other aspects of a network manager's career. ◻

Panel discusses outsourcing

continued from page 26

Another way to mitigate the risks involved in outsourcing, the panel said, is to have carefully defined performance metrics.

"The user's level of risk in outsourcing is directly related to how well they can evaluate the vendor's performance," said Len Evenchik, director of communications for the commonwealth of Massachusetts. "You'll significantly reduce your risk if you can define your expectations and outline the vendor's financial reward in a concise manner."

The panel said users should also be wary of turning over their operations to a single vendor.

"I'd be nervous putting all my eggs into one basket," said Laurie Bride, manager of network architecture at Boeing Computer Services. "In a single-vendor outsourcing arrangement, you run a greater risk of not getting the right tools for the right job."

Most said the ultimate success of an outsourcing arrangement depends largely on the quality of the partnership between the user and the outsourcing firm.

"Without the right people on either side working together, you're placing yourself in a precarious position," said McDonnell Douglas' Gillerman. "If the fit isn't right, I'd suggest you not outsource with that company."

Laurie Bride agreed. "There's a slew of financial, trust and relationship issues that make outsourcing a difficult choice," she said. "When establishing a relationship with a company that's independent of your own, there must be a desire on the part of both parties to work as a team."

> "The user's risk is directly related to how well they evaluate the vendor's performance."
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"Outsourcing will be successful for some and fail miserably for others depending on the cultural makeup and personalities of those involved," she said. ◻

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Tariff 12 users plan for worst

continued from page 1

the FCC must examine in its reinvestigation is whether the packaged network deals are different from their component services purchased from individual tariffs. AT&T must show that Tariff 12 is distinctive enough to warrant pricing the packages at lower rates than individual services.

The FCC reopened its investigation into the legality of Tariff 12 last month after the U.S. Court of Appeals for the District of Columbia last year overturned an earlier decision allowing custom networks.

The FCC is limiting its investigation to the first four Virtual Terminal Network Service deals, made with American Airlines, Inc., American Express, E.I. du Pont de Nemours & Co. and Ford Motor Co., as well as an earlier Tariff 12 option that no one purchases. But it has acknowledged that some of the other Tariff 12 deals raise the same legal issues and may be affected by the ruling.

"I believe Tariff 12 is in real jeopardy right now in Washington," said Laurel Kamen, vice-president of government affairs at American Express. Kamen thinks the FCC will find Tariff 12 lawful but says she believes the odds are only 60-40 in favor of the custom network deals.

"We're looking at contingency planning and urging all of our colleagues to weigh in at the FCC," Kamen said.

George Balog, assistant vice-president of communications and field services at USAir, an early Tariff 12 user, said his firm is also watching the FCC's investigation closely. "We believe its highly probable that Tariff 12 will be upheld," Balog said. "Nevertheless, there's enough of a probability that it could be overturned that we have initiated contingency planning."

Although Tariff 12 users interviewed declined to provide details on their contingency plans, Balog discussed the options users have if Tariff 12 is rejected. "To me, the worst case scenario is that you revert back to standard tariffs," he said, adding that users should first determine how costs would change if they went back to tariffed rates.

Users could also work out a conditional deal with another carrier or take traffic not on the Tariff 12 network and work out a custom network deal with a rival that could be expanded in case of emergency, according to Balog.

> "I believe Tariff 12 is in real jeopardy right now in Washington," said Laurel Kamen.
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Balog said an FCC rejection of Tariff 12 would cause more logistical and billing problems than technical headaches. "As far as I can see, there'd be no reengineering required to convert from Tariff 12 because no reengineering was required to convert from the previous service."

Karen Lobitz, corporate manager of telecommunications at James River Corp., a Tariff 12 user whose deal is not included in the investigation, said she thinks there is a 50-50 chance that the FCC will reject Tariff 12.

"Right now we're feeling that it could go either way, we're sitting on the fence," Lobitz said. "[But] at this point, we're not doing anything as far as contingency planning."

Asea Brown Boveri, Inc., a firm that produces electrical generation equipment, inherited a custom network agreement in January of 1990 when it bought Combustion Engineering, Inc., an early Tariff 12 user. "We're concerned about the outcome of the remand proceeding," said Robert Wachstein, manager of telecommunications at Asea Brown Boveri. The firm has not started any contingency planning, he added.

Users said they have derived benefits from Tariff 12 that they would not have received otherwise and are hopeful the FCC will rule that the network packages are justified.

James River's Lobitz said the primary benefit of Tariff 12 is more efficient network management. "The ability to isolate our network management through one dedicated group of people is very valuable to us," she said.

Lobitz acknowledged that the firm probably could have worked out a deal with AT&T to purchase consolidated network management outside of Tariff 12 but it would have been cumbersome.

"Let's face it, you can buy anything," Lobitz said. "You could put a huge price tag on it and get [network management without Tariff 12] but I don't think it would have been as easy."

For USAir, "one [unique feature of Tariff 12] is the stable, simplified price structure," Balog said. "I don't know any other way [to get] that." He added that improved network management is a primary benefit of Tariff 12 and agrees that such an arrangement might have been achieved with AT&T outside of the custom deal.

"I've asked myself if I could buy [network management] otherwise. I probably could but it wouldn't be as efficient," he said.

John Langhauser, an attorney at AT&T, said consolidated network management and provision of a single network control center are two of the features that make Tariff 12 different from other AT&T services. ◻

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Three RBHCs discuss ISDN strategies

NEW YORK — Three regional Bell holding companies last week updated users on their ISDN deployment schedules and service tariff plans.

At a meeting sponsored by the Corporation for Open Systems International, John Seazholtz, technology and information services vice-president for Bell Atlantic Corp., said the RBHC will equip all digital central offices, representing two-thirds of its access lines in a five-state territory, to support Integrated Services Digital Network by the end of 1992.

However, Bell Atlantic does not see widespread use of ISDN until some time later. "We see ISDN coming on-line in the 1993-1994 time frame," Seazholtz said.

Bell Atlantic will tariff ISDN Centrex service in the second quarter of this year and single-line Centrex in the fourth quarter; Seazholtz declined to disclose when the RBHC will tariff ISDN Primary Rate Interface (PRI) service.

The RBHCs already offer ISDN Centrex service under customer-specific arrangements called special assemblies, but in some cases, they have not yet tariffed Basic Rate Interface (BRI) service.

Nynex Corp., which tariffed BRI services late last year, has deployed ISDN in 20 central office switches, a number that will increase to 25 or 30 by the end of 1992 and to 70 by year end 1993, according to Joe Gustafson, ISDN market planning director for Nynex. The company's switches will be able to support 500,000 to 750,000 ISDN BRI and PRI lines by the end of next year.

Nynex plans to tariff ISDN PRI service in Massachusetts and New York by the end of the month, according to Gustafson.

Gustafson said industry support for National ISDN 1 prompted Nynex to accelerate its deployment of ISDN.

National ISDN 1 is a set of Bell Communications Research Technical References (TR) that specify communications between different vendors' central office switches and provide a single open specification to assure interoperable customer premises equipment.

"Now [ISDN] can be deployed in a more standardized fashion. What we have done here creates an impetus for that increased deployment," Gustafson said.

National ISDN 1 has not accelerated Southwestern Bell Corp.'s ISDN deployment plans. "We were already increasing our ISDN deployment anyhow," said Richard Stephenson, advanced technology director for Southwestern Bell.

Southwestern Bell expects to have 25 of its 1,358 offices equipped to support ISDN by year end and about 50 by the end of 1993. It also plans to have CCS7 support for all central offices in its major metropolitan areas by the end of 1993.

The RBHC plans to tariff PRI service late this year or early next year, Stephenson said.

Southwestern Bell is making extensive use of remote switch modules, which extend from a central office to a customer site to deliver ISDN BRI service to large customers. The RBHC has about 25 ISDN customers representing about 25,000 installed lines, he added.

— Bob Wallace

Firms pledge to support strategy

continued from page 4

Switch Generic 5E7, the operating software for AT&T's 5ESS central office switch that will interoperate with other vendor's switches, will be generally available in March 1992.

Steve Jones, director of switch services product marketing for Northern Telecom, said 20% of the firm's switch research and development funds this year will be used to develop software that incorporates National ISDN 1.

Northern Telecom's Batch Change Supplement-34 central office switch software should be available early next year.

Support of National ISDN 1 may burden switch makers with additional costs because they may have to support both existing proprietary ISDN implementations and National ISDN 1 implementations for some time.

AT&T wants to eventually migrate users from AT&T ISDN implementations to National ISDN 1. "There will be two universes for a while," AT&T's Colson conceded. "AT&T will not dictate how the transition will occur, but we will work with the local exchange carriers to ensure the process occurs in a way that makes sense to the [user]."

Southwestern Bell Corp. has taken a different tack.

"We will follow the lead of the user," said Richard Stephenson, advanced technology district manager for the RBHC. "We will support [proprietary systems] as long as the customer wants it. We are not forcing users to move."

Northern Telecom's approach since 1990 has been to offer users free upgrades from nonstandard alternate mark inversion line coding to 2B1Q line coding. "This is to encourage rapid conversion to the ISDN standard," said Robert Kenedi, vice-president of network architectures for Northern Telecom.

Users may also find that they have fewer services available on a National ISDN 1 link than on a vendor-proprietary ISDN line.

Bellcore's National ISDN 1 description explains that on-demand B-channel packet features on Primary Rate Interface (PRI) lines are not required for National ISDN 1. The D channel will initially be used for signaling to control B channels.

Current PRI customers use the D channel to transmit packetized data at speeds up to 64K bit/sec. The Bellcore document said the D channel on Basic Rate Interface lines can be used for packetized data transmissions at 16K bit/sec.

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Global net users rethink mix

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international voice communications at United Parcel Service, Inc. in Paramus, N.J. "Now you have the luxury of options. Before you didn't have an option."

In order to illustrate these changes, *Network World* has designed a model that shows how the crossover point for international switched circuits vs. private-line services has changed since 1987 (see graphic, page 1).

The model compares the cost of using switched services vs. a multiplexed 56K bit/sec private line between New York and London. This route was chosen because it is one of the busiest international routes and because innovations developed for use between these points often spread elsewhere.

The crossover point was calculated by figuring how much dial-up voice and facsimile traffic would be required before it would be less costly to use a 56K bit/sec private line to carry the same traffic. The figure was calculated for 1987, 1989 and 1991.

The model assumed use of the most advanced voice-compression technology available to users in each year.

Calculations were performed by Communications Network Architects, Inc., a Washington, D.C. consultancy, based on calling patterns that AT&T said are typical of transatlantic users. These patterns include average call durations of 4½ minutes, maximum private-line call blockage of 10%, as well as traffic distribution in which 22% of all calls occur during the busiest hour and 25% of busy-hour calls are for fax transmission.

Voice and fax traffic are treated separately because voice can be compressed more than fax.

Private net costs plummet

Perhaps the most striking finding is that 56K bit/sec circuits are more cost-effective today than in 1987. This is due in large part to the fact that the price of a London-to-New York 56K bit/sec circuit from AT&T and British Telecommunications PLC dropped from about $21,000 per month in 1987 to about $9,800 in 1989 and to $8,400 currently.

New compression technologies also have emerged that enable users to pack up to eight voice channels, or six voice channels and one facsimile channel, on a single 56K bit/sec circuit. In 1987, users could only squeeze a total of two voice or facsimile channels into a 56K bit/sec link.

The result is that the amount of switched traffic required to cost-justify transatlantic private lines has dropped significantly. In 1987, a user meeting the profile in this analysis would have needed to generate 18,765 minutes per month of voice traffic to cost-justify a transatlantic 56K bit/sec circuit.

Given that the leased line supports two channels, trying to squeeze this much traffic into a leased line would result in the blockage of more than 50% of all busy-hour calls, exceeding the 10% rate considered acceptable.

By contrast, in 1989, a user would have required 11,493 minutes per month of switched traffic, or just over nine hours of transmissions per business day, to cost-justify leasing a 56K bit-/sec circuit. This assumes the user derived eight voice channels from the circuit.

These changes are driving many users to deploy new, private transatlantic networks.

But our model also shows that newly available international virtual net services are balancing the scales by reducing the cost of switched services.

For example, a 4½ minute transmission over AT&T's new Global Software-Defined Network (SDN) service now costs $2.88. By contrast, a 4½ minute transmission in 1989 using AT&T's World Connect service — the standard international switched service used by businesses then — cost $4.23.

Thus, Global SDN users today would have to generate at least 11.63 hours of voice and fax traffic per business day to justify a 56K bit/sec leased line, about 22% more than the amount of dial-up traffic required to justify that same line in 1989.

NTIA serves up spectrum plan

continued from page 4

gress intend to make more spectrum publicly available in the future. The FCC is considering reallocating spectrum to accommodate advanced wireless services such as personal communications networks (PCN). And members of Congress, such as Rep. John Dingell (D-Mich.), want to pass legislation freeing up 200 MHz of government spectrum for private sector use.

Obuchowski said, "It's going to be very hard for government people to make the right choices" when spectrum becomes available. She said spectrum auctioning would allow the marketplace to best decide future applications.

The NTIA conceded that its plan may not get enough backing on Capitol Hill so the agency is suggesting user fees as an alternative to bidding for spectrum.

Aides close to Dingell and Rep. Edward Markey (D-Mass.) said they doubted Congress would change its opposition to spectrum auctioning, no matter how the idea is packaged. NTIA has not yet approached Capitol Hill with an official proposal.

An aide to Markey labeled the NTIA's idea a desperate attempt by the administration to drum up money for the tax coffers. "It's Darmageddon," quipped one aide, alluding to Budget Director Richard Darman.

SynOptics airs plan for control

continued from page 1

only see data that is critical to the health of the net.

"We're pushing network management out into the network," said William Lanfri, SynOptics' vice-president of marketing.

Moving the burden of processing information from a centralized management station to multiple remote processors closes the gap with the managed objects, thereby reducing the management traffic on the backbone.

SynOptics' NCE module is based on a Sun Microsystems, Inc. Scalable Processor Architecture processor and resides in SynOptics' LattisNet System 3000 Ethernet concentrator. Data about attached network devices is gathered by a separate management module and is processed by the NCE, which forwards only event messages to the centralized SNMP management station.

The NCE runs SynOptics' LattisNet Network Management for Unix, a program based on Sun's SunNet Manager that allows the NCE to act as a local SNMP management station and control locally attached SNMP devices.

> "We're pushing network management out into the network," said William Lanfri, SynOptics' vice-president of marketing.

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Network Management for Unix also allows the NCE to act as an SNMP proxy agent for a centralized management station. The management station only needs to poll or receive messages from remote NCEs in order to manage remote LAN segments. Without the NCE, the SNMP management stations must individually poll all the devices on those segments.

The NCE will be available in the second quarter of this year at a cost of $9,995.

SynOptics will offer optional software for the NCE that facilitates protocol analysis and load profiling by allowing central management stations to use the NCEs as network analyzer probes, according to company officials.

"It's the same distributed computing concept as the workstation networks themselves," said Michael Howard, president of Infonetics Research Institute, Inc., a San Jose, Calif.-based market research firm. He added that the NCE becomes a platform for upper level applications that help automate net operations.

Those applications will determine when problems are developing, rather then reacting to them as they occur. They will then take corrective or preventive action without intervention.

Management applications

Although they are not as advanced as the programs Howard mentioned, SynOptics also introduced last week a series of network management applications that run on Unix workstations and Microsoft Corp. Windows 3.0-based personal computers.

LattisNet Advanced Network Management, running under Windows, and LattisNet Network Management for Unix, which can be used on Unix workstations as well as the NCE, provide what SynOptics calls Global Network Views, Flat Network Views, Segment Views and Expanded Views.

Global Network Views provides a representation of an entire network and has lower level views nested within it, according to SynOptics officials. Flat Network Views provides automatically updated representations of Ethernet or token-ring networks bounded by routers.

Segment Views provides automatically updated representations of Ethernet or token-ring segments bounded by bridges. Expanded Views provides an updated graphical representation of the SynOptics intelligent hub and each module within it.

LattisNet NetMap 2.0 runs on an OS/2 system along with IBM's NetView/PC to allow NetView consoles to monitor LattisNet networks.

LattisNet Advanced Network Management will be available in the second quarter of this year for $5,500. LattisNet Basic Network Management is available now and costs $2,295. LattisNet Network Management for Unix will be available in the second quarter for $7,000. LattisNet NetMap 2.0 will also be available in the second quarter for $2,495.

Interconnectivity

SynOptics also boosted the internetworking capabilities of its concentrators with the debut of a remote router module employing technology from Cisco Systems, Inc. The LattisNet Model 3386 Remote Ethernet Router, which costs $6,995, supports wide-area links over X.25, frame relay or serial line connections.

The company also introduced two local Ethernet bridges — the $4,795 LattisNet Model 3323S and the $5,295 Model 3324S — which have attachment unit interface and fiber-optic interrepeater link ports, respectively.

SynOptics announced plans to unveil a local token-ring bridge based on technology from Madge Networks, Inc. and a router supporting Ethernet, token ring and Fiber Distributed Data Interface. Both are scheduled for release in the fall. ◘

Early SNMP users face shortcomings

Companies using the Simple Network Management Protocol (SNMP) often have misconceptions about what SNMP can do and must deal with a wide range of products that are not fully interoperable.

Despite the large number of SNMP products on the market, tools that are currently available are "very embryonic," said Jeffrey Case, one of the authors of the SNMP protocol and president of SNMP Research, Inc., an SNMP software supplier.

SNMP products today offer only basic capabilities and do not perform the higher level management functions sometimes ascribed to them, he said.

Independent evaluations of SNMP products have revealed common shortcomings as well, according to Steven Morgenthal, senior consultant for General Logistics International, Inc., a Union, N.J.-based commercial systems integration company.

In tests conducted by Morgenthal, the Management Information Bases (MIB) of the available SNMP products do not perform as promised "almost without exception," he said.

MIBs contain the net objects, or variables, tracked under SNMP. An example of an object is the address errors of packets received. Most vendors add objects to their MIBs, forming proprietary MIB extensions, to provide capabilities not covered by the standard. In order for products from different vendors to be fully interoperable, they must include one another's MIB extensions.

Many SNMP vendors envision a sort of convergence of all proprietary MIB extensions. This convergence will occur when each vendor incorporates the MIB extensions of all other vendors. The vendors admit this is not likely to happen soon.

Equally important is the inclusion of SNMP agents on all network devices.

"Today we're just getting the technology in place," said Michael Howard, president of Infonetics Research Institute, Inc., a San Jose, Calif.-based market research firm. "Not all devices have SNMP agents yet."

The next step is developing higher level network management applications. Current network management applications track activity on the network and take corrective action when problems arise. Future applications will automate network management and initiate preventive, as well as corrective, actions.

The industry today is also characterized by a lack of SNMP expertise, Morgenthal said.

"There are not many sophisticated users yet. Vendors can get away with more [now] than they will be able to in six months," he said.

Case acknowledged that a lack of information has led users to unrealistic expectations about SNMP. A common misconception about SNMP is that it enables users to have one centralized management station for the entire network, an idea vendors haven't been quick to clarify.

SNMP is also a polling protocol. At regular intervals, SNMP management stations send messages to devices in order to determine their status. This management traffic can result in significant overhead. Therefore, users need to determine what information they want and how frequently they want it, Morgenthal said.

— *Eric Smalley*

Telcos meet to form POS rules

continued from page 1

regional Bell holding companies, Cincinnati Bell, Inc. and the U.S. Telephone Association, Chapman said.

Because of antitrust concerns, the group's discussions must focus specifically on technical issues and not on marketing strategies, Chapman said.

Among other things, the first meeting featured a presentation by a consultant representing the National Retail Federation. He called on the carriers to offer faster and less expensive services targeted at both large and small retailers on a nationwide basis.

"In order to offer retailers nationwide network services that appear seamless from state to state, we need some level of coordination," Chapman said.

Fred Morsheimer, director of MIS at Trader Joe's Co., a specialty retailer in South Pasadena, Calif., said carriers' existing and emerging data-over-voice offerings for POS and other transaction-based services are attractive to retailers. "But data-over-voice services could be of limited value to us unless the services of multiple regional carriers are consistent with each other and can be put to use on a nationwide basis," he said.

Although the group will consider multiple technologies, according to Chapman, it is likely carriers will promote data-over-voice technology for transaction processing needs. All of the RBHCs have either investigated, tested or rolled out such services.

US West hopes to begin a controlled commercial rollout of data-over-voice services this spring in Des Moines, Iowa, and Salt Lake City, Chapman said.

Data-over-voice makes it possible to squeeze a data channel onto a dial-up analog or digital voice line at a higher frequency than the channel used to carry voice calls.

It would, for example, enable a cashier at a retail site equipped with only one telephone line to talk on the phone while performing a credit card authorization.

The voice call would be treated as any other dial-up voice call, said Mike Anderson, a product manager at BellSouth Services, Inc. in Birmingham, Ala. The data call, however, would not need to be dialed because once it reached the central office, it would be routed in the same manner each time, probably into a packet network, he said.

This would enable the retailer to pay for one less link and speed customer service by reducing POS transactions from 12 to 28 seconds to about seven seconds, some carriers estimate.

Pacific Bell last week became the most recent Bell operating company to announce the completion of a data-over-voice trial. The carrier hopes to convert the technology into a commercial offering by this summer, said Barry Schloffel, a product manager in Pacific Bell's Data Communications Group.

Pacific Bell's test, which was conducted in conjunction with Integrated Network Corp. (INC), J.C. Penney Business Services, Inc., Northern Telecom, Inc. and VeriFone, Inc. involved sending voice and data simultaneously from integrated data/voice point-of-sale terminals across telephone lines.

In the test, J.C. Penney Business Services provided credit authorization to five unnamed retail sites, all of which used VeriFone's point-of-sale terminals.

An INC data/voice multiplexer at the retail site multiplexed the voice and data traffic onto the line and a companion device at the central office demultiplexed it. Data was supported at 4.8K bit/sec in the test.

At the central office, the data channel was peeled off and transported to a J.C. Penney Business Services host computer via Pacific Bell's Public Packet Switching network, which is based on Northern Telecom equipment. A Pacific Bell 56K bit/sec X.25 link was used for the final connection to the J.C. Penney host.

The virtual dedicated link between the retail sites and the Pacific Bell central office eliminated dialing, showing that credit card authorization time could be reduced. ◘

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